

46°, 314° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.				
	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z					
0	4	51.4	+59.7	133.8	4	09.8	+59.9	133.8	3	28.3	+59.8	133.9	2	46.6	+60.0	133.9	2	05.0	+60.0	134.0	1	23.4	+59.9	134.0	0	00.0	+60.0	134.0	0
1	5	51.1	+59.8	133.7	5	09.7	+59.8	133.8	4	28.1	+59.9	133.8	3	46.6	+59.9	133.9	3	05.0	+59.9	133.9	2	23.3	+60.0	134.0	1	41.7	+60.0	134.0	1
2	6	50.9	+59.8	133.6	6	09.5	+59.8	133.7	5	28.0	+59.9	133.8	4	46.5	+59.9	133.8	4	04.9	+60.0	133.9	3	23.3	+60.0	133.9	2	41.7	+60.0	134.0	2
3	7	50.7	+59.7	133.5	7	09.3	+59.9	133.6	6	27.9	+59.9	133.7	5	46.4	+59.9	133.8	5	04.9	+59.9	133.8	4	23.3	+60.0	133.9	3	41.7	+60.0	134.0	3
4	8	50.4	+59.8	133.4	8	09.2	+59.8	133.5	7	27.8	+59.9	133.6	6	46.3	+60.0	133.7	6	04.8	+60.0	133.8	5	23.3	+60.0	133.9	4	41.7	+60.0	134.0	4
5	9	50.2	+59.8	133.3	9	09.0	+59.8	133.5	8	27.7	+59.9	133.6	7	46.3	+59.9	133.7	7	04.8	+60.0	133.8	6	23.3	+59.9	133.9	5	41.7	+59.9	133.9	5
6	10	50.0	+59.7	133.2	10	08.8	+59.8	133.4	9	27.5	+59.9	133.5	8	46.2	+59.9	133.6	8	04.8	+59.9	133.7	7	23.2	+60.0	133.8	6	41.6	+60.0	134.0	6
7	11	49.7	+59.8	133.2	11	08.6	+59.9	133.3	10	27.4	+59.9	133.4	9	46.1	+59.9	133.6	9	04.7	+60.0	133.7	8	23.2	+60.0	133.8	7	41.6	+60.0	134.0	7
8	12	49.5	+59.7	133.1	12	08.5	+59.8	133.2	11	27.3	+59.9	133.4	10	46.0	+60.0	133.5	10	04.7	+59.9	133.7	9	23.2	+60.0	133.8	8	41.6	+60.0	134.0	8
9	13	49.2	+59.8	133.0	13	08.3	+59.8	133.1	12	27.2	+59.9	133.3	11	46.0	+59.9	133.5	11	04.6	+60.0	133.6	10	23.2	+60.0	133.8	9	41.6	+60.0	134.0	9
10	14	49.0	+59.7	132.9	14	08.1	+59.8	133.1	13	27.1	+59.8	133.2	12	45.9	+59.9	133.4	12	04.6	+59.9	133.6	11	23.2	+59.9	133.7	10	41.6	+60.0	133.9	10
11	15	48.7	+59.8	132.8	15	07.9	+59.8	133.0	14	26.9	+59.9	133.2	13	45.8	+59.9	133.4	13	04.5	+60.0	133.5	12	23.1	+60.0	133.7	11	41.6	+60.0	134.0	11
12	16	48.5	+59.7	132.7	16	07.7	+59.8	132.9	15	26.8	+59.9	133.1	14	45.7	+59.9	133.3	14	04.5	+59.9	133.5	13	23.1	+60.0	133.7	12	41.6	+60.0	134.0	12
13	17	48.2	+59.8	132.6	17	07.5	+59.9	132.8	16	26.7	+59.8	133.0	15	45.6	+60.0	133.3	15	04.4	+60.0	133.5	14	23.1	+60.0	133.6	13	41.6	+60.0	134.0	13
14	18	48.0	+59.7	132.5	18	07.4	+59.8	132.7	17	26.5	+59.9	133.0	16	45.6	+59.9	133.2	16	04.4	+60.0	133.6	15	23.1	+60.0	133.8	14	41.6	+60.0	134.0	14
15	19	47.7	+59.8	132.4	19	07.2	+59.8	132.7	18	26.4	+59.9	132.9	17	45.5	+59.9	133.1	17	04.3	+60.0	133.4	16	23.1	+59.9	133.6	15	41.6	+60.0	133.8	15
16	20	47.5	+59.7	132.3	20	07.0	+59.8	132.6	19	26.3	+59.8	132.8	18	45.4	+59.9	133.1	18	04.3	+60.0	133.3	17	23.0	+60.0	133.6	16	41.6	+60.0	134.0	16
17	21	47.2	+59.7	132.2	21	06.8	+59.8	132.5	20	26.1	+59.9	132.8	19	45.3	+59.9	133.0	19	04.3	+59.9	133.3	18	23.0	+60.0	133.5	17	41.6	+60.0	134.0	17
18	22	46.9	+59.8	132.1	22	06.6	+59.8	132.4	21	26.0	+59.9	132.7	20	45.2	+59.9	133.0	20	04.2	+60.0	133.3	19	23.0	+60.0	133.5	18	41.6	+60.0	134.0	18
19	23	46.7	+59.7	132.0	23	06.4	+59.8	132.3	22	25.9	+59.8	132.6	21	45.1	+59.9	132.9	21	04.2	+59.9	133.2	20	23.0	+60.0	133.5	19	41.6	+60.0	134.0	19
20	24	46.4	+59.7	131.9	24	06.2	+59.8	132.2	23	25.7	+59.9	132.5	22	45.0	+60.0	132.9	22	04.1	+60.0	133.2	21	23.0	+59.9	133.5	20	41.6	+60.0	133.7	20
21	25	46.1	+59.7	131.8	25	06.0	+59.8	132.1	24	25.6	+59.8	132.5	23	45.0	+59.9	133.2	23	04.1	+59.9	133.1	22	22.9	+60.0	133.4	21	41.6	+60.0	134.0	21
22	26	45.8	+59.7	131.7	26	05.8	+59.8	132.0	25	25.4	+59.8	132.4	24	44.9	+59.9	132.7	24	04.0	+60.0	133.1	23	22.9	+60.0	133.4	22	41.6	+60.0	134.0	22
23	27	45.5	+59.7	131.6	27	05.6	+59.7	131.9	26	25.3	+59.9	132.3	25	44.8	+59.9	132.7	25	04.0	+59.9	133.0	24	22.9	+59.9	133.3	23	41.6	+60.0	134.0	23
24	28	45.2	+59.7	131.4	28	05.3	+59.8	131.9	27	25.2	+59.8	132.2	26	44.7	+59.9	132.6	26	03.9	+60.0	133.0	25	22.9	+59.9	133.3	24	41.6	+60.0	134.0	24
25	29	44.9	+59.7	131.3	29	05.1	+59.8	131.8	28	25.0	+59.8	132.2	27	44.6	+59.9	132.6	27	03.9	+59.9	132.9	26	22.8	+60.0	133.3	25	41.6	+59.9	133.7	25
26	30	44.6	+59.7	131.2	30	04.9	+59.8	131.7	29	24.8	+59.8	132.1	28	44.5	+59.9	132.5	28	03.8	+59.8	132.9	27	22.8	+60.0	133.3	26	41.5	+60.0	134.0	26
27	31	44.3	+59.7	131.1	31	04.7	+59.7	131.6	30	24.7	+59.8	132.0	29	44.4	+59.9	132.4	29	03.7	+60.0	132.8	28	22.8	+59.9	133.2	27	41.5	+60.0	134.0	27
28	32	44.0	+59.6	131.0	32	04.4	+59.8	131.4	31	24.5	+59.9	131.9	30	44.3	+59.9	132.4	30	03.7	+59.9	132.8	29	22.8	+59.9	133.6	28	41.5	+60.0	134.0	28
29	33	43.6	+59.7	130.8	33	04.2	+59.7	131.3	32	24.4	+59.8	131.8	31	44.2	+59.9	132.3	31	03.6	+60.0	132.7	30	22.7	+60.0	133.2	29	41.5	+60.0	134.0	29
30	34	43.3	+59.6	130.7	34	03.9	+59.8	131.2	33	24.2	+59.8	131.7	32	44.1	+59.9	132.2	32	03.6	+59.9	132.7	31	22.7	+60.0	133.1	30	41.5	+60.0	134.0	30
31	35	42.9	+59.7	130.6	35	03.7	+59.7	131.1	34	24.0	+59.9	131.6	33	44.0	+59.9	132.1	33	03.5	+59.9	132.6	32	22.7	+60.0	133.1	31	41.5	+60.0	134.0	31
32	36	42.6	+59.6	130.5	36	03.4	+59.8	131.0	35	23.9	+59.8	131.6	34	43.9	+59.8	132.1	34	03.4	+60.0	132.6	33	22.7	+59.9	133.1	32	41.5	+60.0	134.0	32
33	37	42.2	+59.7	130.3	37	03.2	+59.7	130.9	36	23.7	+59.8	131.5	35	43.7	+59.9	132.0	35	03.4	+59.9	132.5	34	22.6	+60.0	133.0	33	41.5	+60.0	134.0	33
34	38	41.9	+59.6	130.2	38	02.9	+59.7	130.8	37	23.5	+59.8	131.4	36	43.6	+59.9	132.0	36	03.3	+60.0	133.0	35	22.6	+60.0	133.5	34	41.5	+60.0	134.0	34
35	39	41.5	+59.6	130.0	39	02.6	+59.7	130.7	38	23.3	+59.8	131.3	37	43.5	+59.9	131.8	37	03.3	+59.9	132.4	36	22.6	+59.9	133.5	35	41.5	+60.0	134.0	35
36	40	41.1	+59.6	129.9	40	02.3	+59.7	130.5	39	23.1	+59.8	131.2	38	43.4	+59.9	131.8	38	03.2	+59.9	132.3	37	22.5	+60.0	133.5	36	41.5	+60.0	134.0	36
37	41	40.7	+59.5	129.7	41																								

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $46^\circ$ , 314°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
	Hc	d	Z	Hc	d	Z																			
0	4 51.4 -59.8	133.8		4 09.8 -59.8	133.8		3 28.3 -59.9	133.9		2 46.6 -59.9	133.9		2 05.0 -59.9	134.0		1 23.4 -60.0	134.0		0 41.7 -60.0	134.0		0 00.0 +60.0	46.0		0
1	3 51.6 -59.8	133.9		3 10.0 -59.8	133.9		2 28.4 -59.9	134.0		1 46.7 -59.9	134.0		1 05.1 -60.0	134.0		0 23.4 -60.0	134.0		0 18.3 +60.0	46.0		1 00.0 +60.0	46.0		1
2	2 51.8 -59.7	134.0		2 10.2 -59.8	134.0		1 28.5 -59.9	134.0		0 46.8 -59.9	134.0		0 05.1 -60.0	134.0		0 36.6 +60.0	46.0		1 18.3 +60.0	46.0		2 00.0 +60.0	46.0		2
3	1 52.1 -59.8	134.0		1 10.4 -59.9	134.1		0 28.6 -59.9	134.1		0 13.1 +59.9	45.9		0 54.9 +59.9	45.9		1 36.6 +60.0	45.9		2 18.3 +60.0	46.0		3 00.0 +60.0	46.0		3
4	0 52.3 -59.8	134.1		0 10.5 -59.8	134.1		0 31.3 +59.8	45.9		1 13.0 +60.0	45.9		1 54.8 +60.0	45.9		2 36.6 +60.0	45.9		3 18.3 +60.0	46.0		4 00.0 +60.0	46.0		4
5	0 07.5 +59.7	45.8		0 49.3 +59.8	45.8		1 31.1 +59.9	45.8		2 13.0 +59.9	45.8		2 54.8 +59.9	45.9		3 36.6 +59.9	45.9		4 18.3 +60.0	45.9		5 00.0 +60.0	46.0		5
6	1 07.2 +59.8	45.7		1 49.1 +59.9	45.7		2 31.0 +59.9	45.7		3 12.9 +59.9	45.8		3 54.7 +60.0	45.8		4 36.5 +60.0	45.9		5 18.3 +60.0	45.9		6 00.0 +60.0	46.0		6
7	2 07.0 +59.8	45.6		2 49.0 +59.8	45.6		3 30.9 +59.9	45.7		4 12.8 +59.9	45.7		4 54.7 +59.9	45.8		5 36.5 +60.0	45.8		6 18.3 +60.0	45.9		7 00.0 +60.0	46.0		7
8	3 06.8 +59.7	45.5		3 48.8 +59.8	45.6		4 30.8 +59.9	45.6		5 12.7 +60.0	45.7		5 54.6 +60.0	45.7		6 36.5 +60.0	45.8		7 18.3 +60.0	45.9		8 00.0 +60.0	46.0		8
9	4 06.5 +59.8	45.4		4 48.6 +59.9	45.5		5 30.7 +59.8	45.5		6 12.7 +59.9	45.6		6 54.6 +60.0	45.7		7 36.5 +60.0	45.8		8 18.3 +60.0	45.9		9 00.0 +60.0	46.0		9
10	5 06.3 +59.8	45.3		5 48.5 +59.8	45.4		6 30.6 +59.8	45.5		7 12.6 +59.9	45.6		7 54.6 +59.9	45.7		8 36.5 +59.9	45.8		9 18.3 +60.0	45.9		10 00.0 +60.0	46.0		10
11	6 06.1 +59.7	45.2		6 48.3 +59.8	45.3		7 30.4 +59.9	45.4		8 12.5 +59.9	45.5		8 54.5 +60.0	45.6		9 36.4 +60.0	45.7		10 18.3 +60.0	45.9		11 00.0 +60.0	46.0		11
12	7 05.8 +59.8	45.2		7 48.1 +59.8	45.3		8 30.3 +59.9	45.4		9 12.4 +60.0	45.5		9 54.5 +59.9	45.6		10 36.4 +60.0	45.7		11 18.3 +60.0	45.9		12 00.0 +60.0	46.0		12
13	8 05.6 +59.8	45.1		8 47.9 +59.9	45.2		9 30.2 +59.9	45.3		10 12.4 +59.9	45.4		10 54.4 +60.0	45.5		11 36.4 +60.0	45.7		12 18.3 +60.0	45.8		13 00.0 +60.0	46.0		13
14	9 05.4 +59.7	45.0		9 47.8 +59.8	45.1		10 30.1 +59.8	45.2		11 12.3 +59.9	45.4		11 54.4 +59.9	45.5		12 36.4 +60.0	45.7		13 18.3 +59.9	45.8		14 00.0 +60.0	46.0		14
15	10 05.1 +59.8	44.9		10 47.6 +59.8	45.0		11 29.9 +59.9	45.3		12 12.2 +59.9	45.3		12 54.3 +60.0	45.5		13 36.4 +59.9	45.6		14 18.2 +60.0	45.8		15 00.0 +60.0	46.0		15
16	11 04.9 +59.7	44.8		11 47.4 +59.8	44.9		12 29.8 +59.9	45.1		13 12.1 +59.9	45.3		13 54.3 +60.0	45.4		14 36.3 +60.0	45.6		15 18.2 +60.0	45.8		16 00.0 +60.0	46.0		16
17	12 04.6 +59.8	44.7		12 47.2 +59.9	44.9		13 29.7 +59.9	45.0		14 12.0 +60.0	45.2		14 54.3 +59.9	45.4		15 36.3 +60.0	45.6		16 18.2 +60.0	45.8		17 00.0 +60.0	46.0		17
18	13 04.4 +59.8	44.6		13 47.1 +59.8	44.8		14 29.6 +59.9	45.0		15 12.0 +59.9	45.1		15 54.2 +60.0	45.3		16 36.3 +60.0	45.6		17 18.2 +60.0	45.8		18 00.0 +60.0	46.0		18
19	14 04.2 +59.7	44.5		14 46.9 +59.8	44.7		15 29.5 +59.8	44.9		16 11.9 +59.9	45.1		16 54.2 +59.9	45.3		17 36.3 +60.0	45.5		18 18.2 +60.0	45.8		19 00.0 +60.0	46.0		19
20	15 03.9 +59.8	44.4		15 46.7 +59.8	44.6		16 29.3 +59.9	44.8		17 11.8 +59.9	45.0		17 54.1 +60.0	45.3		18 36.3 +59.9	45.5		19 18.2 +60.0	45.7		20 00.0 +60.0	46.0		20
21	16 03.7 +59.7	44.3		16 46.5 +59.8	44.5		17 29.2 +59.9	44.8		18 11.7 +59.9	45.0		18 54.1 +59.9	45.2		19 36.2 +60.0	45.5		20 18.2 +60.0	45.7		21 00.0 +60.0	46.0		21
22	17 03.4 +59.8	44.2		17 46.3 +59.8	44.5		18 29.1 +59.8	44.7		19 11.6 +59.9	44.9		19 54.0 +60.0	45.2		20 36.2 +60.0	45.4		21 18.2 +60.0	45.7		22 00.0 +60.0	46.0		22
23	18 03.2 +59.7	44.1		18 46.1 +59.8	44.4		19 28.9 +59.9	44.6		20 11.5 +60.0	44.9		20 54.0 +59.9	45.1		21 36.2 +60.0	45.4		22 18.2 +60.0	45.7		23 00.0 +60.0	46.0		23
24	19 02.9 +59.7	44.0		19 45.9 +59.8	44.3		20 28.8 +59.9	44.5		21 11.5 +59.9	44.8		21 53.9 +60.0	45.1		22 36.2 +59.9	45.4		23 18.2 +60.0	45.7		24 00.0 +60.0	46.0		24
25	20 02.6 +59.8	43.9		20 45.7 +59.9	44.2		21 28.7 +59.8	44.5		22 11.4 +59.9	44.8		22 53.9 +59.9	45.0		23 36.1 +60.0	45.4		24 18.2 +60.0	45.7		25 00.0 +60.0	46.0		25
26	21 02.4 +59.7	43.8		21 45.6 +59.8	44.1		22 28.5 +59.9	44.4		23 11.3 +59.9	44.7		23 53.8 +60.0	45.0		24 36.1 +60.0	45.3		25 18.2 +60.0	45.7		26 00.0 +60.0	46.0		26
27	22 02.1 +59.7	43.7		22 45.4 +59.8	44.0		23 28.4 +59.8	44.3		24 11.2 +59.9	44.6		24 53.8 +59.9	45.0		25 36.1 +60.0	45.3		26 18.2 +60.0	45.6		27 00.0 +60.0	46.0		27
28	23 01.8 +59.8	43.6		23 45.2 +59.7	43.9		24 28.2 +59.9	44.3		25 11.1 +59.9	44.6		25 53.7 +60.0	44.9		26 36.1 +60.0	45.3		27 18.2 +60.0	45.6		28 00.0 +60.0	46.0		28
29	24 01.6 +59.7	43.5		24 44.9 +59.8	43.9		25 28.1 +59.8	44.2		26 11.0 +59.9	44.5		26 53.7 +59.9	44.9		27 36.1 +59.9	45.2		28 18.2 +60.0	45.6		29 00.0 +60.0	46.0		29
30	25 01.3 +59.7	43.4		25 44.7 +59.8	43.8		26 28.0 +59.8	44.1		27 10.9 +59.9	44.5		27 53.6 +60.0	44.8		28 36.0 +60.0	45.2		29 18.2 +60.0	45.6		30 00.0 +60.0	46.0		30
31	26 01.0 +59.7	43.3		26 44.5 +59.8	43.7		27 27.8 +59.9	44.0		28 10.8 +59.9	44.4		28 53.6 +59.9	44.8		29 36.0 +60.0	45.2		30 18.2 +60.0	45.6		31 00.0 +60.0	46.0		31
32	27 00.7 +59.7	43.2		27 44.3 +59.8	43.6		28 27.7 +59.8	43.9		29 10.7 +59.9	44.3		29 53.5 +59.9	44.7		30 36.0 +60.0	45.1		31 18.2 +59.9	45.6		32 00.0 +60.0	46.0		32
33	28 00.4 +59.7	43.1		28 44.1 +59.8	43.5		29 27.5 +59.8	43.9		30 10.6 +59.9	44.3		30 53.4 +60.0	44.7		31 36.0 +59.9	45.1		32 18.1 +60.0	45.5		33 00.0 +60.0	46.0		33
34	29 00.1 +59.7	43.0		29 43.9 +59.7	43.4		30 27.3 +59.9	43.8		31 10.5 +59.9	44.2		31 53.4 +59.9	44.6		32 35.9 +60.0	45.1		33 18.1 +60.0	45.5		34 00.0 +60.0	46.0		34
35	29 59.8 +59.7	42.9		30 43.6 +59.8	43.3		31 27.2 +59.8	43.7		32 10.4 +59.9	44.1		32 53.3 +60.0	44.6		33 35.9 +60.0	45.0		34 18.1 +60.0	45.5		35 00.0 +60.0	46.0		35
36	30 59.5 +59.7	42.8		31 43.4 +59.8	43.2		32 27.0 +59.9	43.6		33 10.3 +59.9	44.0		33 53.3 +59.9	44.5		34 35.9 +59.9	45.0		35 18.1 +60.0	45.5		36 00.0 +60.0	46.0		36
37	31 59.2 +59.7	42.6		32 43.2 +59.7	43.1		33 26.9 +59.8	43.5		34 10.2 +59.9	44.0		34 53.2 +59.9	44.5		35 35.8 +60.0	45.0		36 18.1 +60.0	45.5		37 00.0 +60.0	46.0		37
38	32 58.9 +59.6																								

47°, 313° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
Dec.	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Dec.
0	4 46.1 + 59.7	132.8	4 05.3 + 59.8	132.8	3 24.5 + 59.8	132.9	2 43.6 + 59.9	132.9	2 02.7 + 60.0	133.0	1 21.8 + 60.0	133.0	0 40.9 + 60.0	133.0	0 00.0 + 60.0	133.0	0 00.0 + 60.0	133.0	0 00.0 + 60.0	133.0	0 00.0 + 60.0	133.0	0 00.0 + 60.0	133.0	0
1	5 45.8 + 59.8	132.7	5 05.1 + 59.8	132.8	4 24.3 + 59.9	132.8	3 43.5 + 60.0	132.9	3 02.7 + 59.9	132.9	2 21.8 + 60.0	133.0	1 40.9 + 60.0	133.0	1 00.0 + 60.0	133.0	1 00.0 + 60.0	133.0	1 00.0 + 60.0	133.0	1 00.0 + 60.0	133.0	1 00.0 + 60.0	133.0	1
2	6 45.6 + 59.7	132.6	6 04.9 + 59.8	132.7	5 24.2 + 59.9	132.8	4 43.5 + 59.9	132.8	4 02.6 + 60.0	132.9	3 21.8 + 60.0	132.9	2 40.9 + 60.0	133.0	2 00.0 + 60.0	133.0	2 00.0 + 60.0	133.0	2 00.0 + 60.0	133.0	2 00.0 + 60.0	133.0	2 00.0 + 60.0	133.0	2
3	7 45.3 + 59.8	132.5	7 04.7 + 59.9	132.6	6 24.1 + 59.9	132.7	5 43.4 + 59.9	132.8	5 02.6 + 60.0	132.8	4 21.8 + 60.0	132.9	3 40.9 + 60.0	133.0	3 00.0 + 60.0	133.0	3 00.0 + 60.0	133.0	3 00.0 + 60.0	133.0	3 00.0 + 60.0	133.0	3 00.0 + 60.0	133.0	3
4	8 45.1 + 59.7	132.4	8 04.6 + 59.8	132.5	7 24.0 + 59.8	132.6	6 43.3 + 59.9	132.7	6 02.6 + 59.9	132.8	5 21.8 + 59.9	132.9	4 40.9 + 60.0	133.0	4 00.0 + 60.0	133.0	4 00.0 + 60.0	133.0	4 00.0 + 60.0	133.0	4 00.0 + 60.0	133.0	4 00.0 + 60.0	133.0	4
5	9 44.8 + 59.8	132.3	9 04.4 + 59.8	132.5	8 23.8 + 59.9	132.6	7 43.2 + 59.9	132.7	7 02.5 + 60.0	132.8	6 21.7 + 60.0	132.9	5 40.9 + 60.0	132.9	5 00.0 + 60.0	133.0	5 00.0 + 60.0	133.0	5 00.0 + 60.0	133.0	5 00.0 + 60.0	133.0	5 00.0 + 60.0	133.0	5
6	10 44.6 + 59.7	132.2	10 04.2 + 59.8	132.4	9 23.7 + 59.9	132.5	8 43.1 + 60.0	132.6	8 02.5 + 59.9	132.7	7 21.7 + 60.0	132.8	6 40.9 + 60.0	132.9	6 00.0 + 60.0	133.0	6 00.0 + 60.0	133.0	6 00.0 + 60.0	133.0	6 00.0 + 60.0	133.0	6 00.0 + 60.0	133.0	6
7	11 44.3 + 59.8	132.1	11 04.0 + 59.8	132.3	10 23.6 + 59.9	132.4	9 43.1 + 59.9	132.6	9 02.4 + 60.0	132.7	8 21.7 + 60.0	132.8	7 40.9 + 60.0	132.9	7 00.0 + 60.0	133.0	7 00.0 + 60.0	133.0	7 00.0 + 60.0	133.0	7 00.0 + 60.0	133.0	7 00.0 + 60.0	133.0	7
8	12 44.1 + 59.7	132.1	12 03.8 + 59.9	132.2	11 23.5 + 59.8	132.4	10 43.0 + 59.9	132.5	10 02.4 + 59.9	132.7	9 21.7 + 60.0	132.8	8 40.9 + 60.0	132.9	8 00.0 + 60.0	133.0	8 00.0 + 60.0	133.0	8 00.0 + 60.0	133.0	8 00.0 + 60.0	133.0	8 00.0 + 60.0	133.0	8
9	13 43.8 + 59.8	132.0	13 03.7 + 59.8	132.1	12 23.3 + 59.9	132.3	11 42.9 + 59.9	132.5	11 02.3 + 60.0	132.6	10 21.7 + 59.9	132.7	9 40.9 + 60.0	132.9	9 00.0 + 60.0	133.0	9 00.0 + 60.0	133.0	9 00.0 + 60.0	133.0	9 00.0 + 60.0	133.0	9 00.0 + 60.0	133.0	9
10	14 43.6 + 59.7	131.9	14 03.5 + 59.8	132.1	13 23.2 + 59.9	132.2	12 42.8 + 59.9	132.4	12 02.3 + 59.9	132.6	11 21.6 + 60.0	132.7	10 40.9 + 60.0	132.9	10 00.0 + 60.0	133.0	10 00.0 + 60.0	133.0	10 00.0 + 60.0	133.0	10 00.0 + 60.0	133.0	10 00.0 + 60.0	133.0	10
11	15 43.3 + 59.8	131.8	15 03.3 + 59.8	132.0	14 23.1 + 59.9	132.2	13 42.7 + 59.9	132.4	13 02.2 + 60.0	132.5	12 21.6 + 60.0	132.7	11 40.9 + 60.0	132.9	11 00.0 + 60.0	133.0	11 00.0 + 60.0	133.0	11 00.0 + 60.0	133.0	11 00.0 + 60.0	133.0	11 00.0 + 60.0	133.0	11
12	16 43.1 + 59.7	131.7	16 03.1 + 59.8	131.9	15 23.0 + 59.8	132.1	14 42.6 + 60.0	132.3	14 02.2 + 59.9	132.5	13 21.6 + 60.0	132.7	12 40.9 + 60.0	132.8	12 00.0 + 60.0	133.0	12 00.0 + 60.0	133.0	12 00.0 + 60.0	133.0	12 00.0 + 60.0	133.0	12 00.0 + 60.0	133.0	12
13	17 42.8 + 59.7	131.6	17 02.9 + 59.8	131.8	16 22.8 + 59.9	132.0	15 42.6 + 59.9	132.2	15 02.1 + 60.0	132.4	14 21.6 + 59.9	132.6	13 40.9 + 59.9	132.8	13 00.0 + 60.0	133.0	13 00.0 + 60.0	133.0	13 00.0 + 60.0	133.0	13 00.0 + 60.0	133.0	13 00.0 + 60.0	133.0	13
14	18 42.5 + 59.8	131.5	18 02.7 + 59.8	131.7	17 22.7 + 59.9	132.0	16 42.5 + 59.9	132.2	16 02.1 + 59.9	132.4	15 21.5 + 60.0	132.6	14 40.8 + 60.0	132.8	14 00.0 + 60.0	133.0	14 00.0 + 60.0	133.0	14 00.0 + 60.0	133.0	14 00.0 + 60.0	133.0	14 00.0 + 60.0	133.0	14
15	19 42.3 + 59.7	131.4	19 02.5 + 59.8	131.6	18 22.6 + 59.8	131.9	17 42.4 + 59.9	132.1	17 02.0 + 60.0	132.4	16 21.5 + 60.0	132.6	15 40.8 + 60.0	132.8	15 00.0 + 60.0	133.0	15 00.0 + 60.0	133.0	15 00.0 + 60.0	133.0	15 00.0 + 60.0	133.0	15 00.0 + 60.0	133.0	15
16	20 42.0 + 59.7	131.3	20 02.3 + 59.8	131.6	19 22.4 + 59.9	131.8	18 42.3 + 59.9	132.1	18 02.0 + 60.0	132.3	17 21.5 + 60.0	132.6	16 40.8 + 60.0	132.8	16 00.0 + 60.0	133.0	16 00.0 + 60.0	133.0	16 00.0 + 60.0	133.0	16 00.0 + 60.0	133.0	16 00.0 + 60.0	133.0	16
17	21 41.7 + 59.8	131.2	21 02.1 + 59.8	131.5	20 22.3 + 59.8	131.7	19 42.2 + 59.9	132.0	19 02.0 + 59.9	132.3	18 21.5 + 60.0	132.5	17 40.8 + 60.0	132.8	17 00.0 + 60.0	133.0	17 00.0 + 60.0	133.0	17 00.0 + 60.0	133.0	17 00.0 + 60.0	133.0	17 00.0 + 60.0	133.0	17
18	22 41.5 + 59.7	131.1	22 01.9 + 59.8	131.4	21 22.1 + 59.9	131.7	20 42.1 + 59.9	132.0	20 01.9 + 60.0	132.2	19 21.5 + 59.9	132.5	18 40.8 + 60.0	132.8	18 00.0 + 60.0	133.0	18 00.0 + 60.0	133.0	18 00.0 + 60.0	133.0	18 00.0 + 60.0	133.0	18 00.0 + 60.0	133.0	18
19	23 41.2 + 59.7	131.0	23 01.7 + 59.8	131.3	22 22.0 + 59.9	131.6	21 42.0 + 59.9	131.9	21 01.9 + 59.9	132.2	20 21.4 + 60.0	132.5	19 40.8 + 60.0	132.7	19 00.0 + 60.0	133.0	19 00.0 + 60.0	133.0	19 00.0 + 60.0	133.0	19 00.0 + 60.0	133.0	19 00.0 + 60.0	133.0	19
20	24 40.9 + 59.7	130.9	24 01.5 + 59.8	131.2	23 21.9 + 59.8	131.5	22 41.9 + 60.0	131.8	22 01.8 + 59.9	132.2	21 21.4 + 60.0	132.4	20 40.8 + 60.0	132.7	20 00.0 + 60.0	133.0	20 00.0 + 60.0	133.0	20 00.0 + 60.0	133.0	20 00.0 + 60.0	133.0	20 00.0 + 60.0	133.0	20
21	25 40.6 + 59.7	130.7	25 01.3 + 59.8	131.1	24 21.7 + 59.9	131.5	23 41.9 + 59.9	131.8	23 01.7 + 60.0	132.1	22 21.4 + 60.0	132.4	21 40.8 + 60.0	132.7	21 00.0 + 60.0	133.0	21 00.0 + 60.0	133.0	21 00.0 + 60.0	133.0	21 00.0 + 60.0	133.0	21 00.0 + 60.0	133.0	21
22	26 40.3 + 59.7	130.6	26 01.1 + 59.8	131.0	25 21.6 + 59.8	131.4	24 41.8 + 59.9	131.7	24 01.7 + 59.9	132.1	23 21.4 + 60.0	132.4	22 40.8 + 60.0	132.7	22 00.0 + 60.0	133.0	22 00.0 + 60.0	133.0	22 00.0 + 60.0	133.0	22 00.0 + 60.0	133.0	22 00.0 + 60.0	133.0	22
23	27 40.0 + 59.7	130.5	27 00.9 + 59.7	130.9	26 21.4 + 59.9	131.3	25 41.7 + 59.9	131.7	25 01.6 + 60.0	132.0	24 21.4 + 59.9	132.4	23 40.8 + 60.0	132.7	23 00.0 + 60.0	133.0	23 00.0 + 60.0	133.0	23 00.0 + 60.0	133.0	23 00.0 + 60.0	133.0	23 00.0 + 60.0	133.0	23
24	28 39.7 + 59.7	130.4	28 00.6 + 59.8	130.8	27 21.1 + 59.8	131.1	26 41.5 + 59.9	131.5	27 01.5 + 60.0	131.9	26 21.3 + 60.0	132.3	25 40.8 + 60.0	132.7	25 00.0 + 60.0	133.0	25 00.0 + 60.0	133.0	25 00.0 + 60.0	133.0	25 00.0 + 60.0	133.0	25 00.0 + 60.0	133.0	25
25	29 39.4 + 59.7	130.3	29 00.4 + 59.8	130.7	28 21.1 + 59.8	131.1	27 41.3 + 59.9	131.5	27 01.5 + 60.0	131.9	26 21.3 + 60.0	132.3	25 40.8 + 60.0	132.7	25 00.0 + 60.0	133.0	25 00.0 + 60.0	133.0	25 00.0 + 60.0	133.0	25 00.0 + 60.0	133.0	25 00.0 + 60.0	133.0	25
26	30 39.1 + 59.6	130.2	30 00.2 + 59.7	130.6	29 20.9 + 59.9	131.1	28 41.4 + 59.9	131.5	28 01.5 + 59.9	131.9	27 21.3 + 60.0	132.3	26 40.8 + 60.0	132.6	26 00.0 + 60.0	133.0	26 00.0 + 60.0	133.0	26 00.0 + 60.0	133.0	26 00.0 + 60.0	133.0	26 00.0 + 60.0	133.0	26
27	31 38.7 + 59.7	130.1	30 59.9 + 59.8	130.5	30 20.8 + 59.8	131.0	29 41.3 + 59.9	131.4	29 01.4 + 60.0	131.8	28 21.3 + 59.9	132.2	27 40.8 + 60.0	132.6	27 00.0 + 60.0	133.0	27 00.0 + 60.0	133.0	27 00.0 + 60.0	13					

**LATITUDE CONTRARY NAME TO DECLINATION**

**L.H.A. 47°, 313°**

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
	Hc	d	Z	Hc	d	Z																			
0	4 46.1 -59.8	132.8		4 05.3 -59.8	132.8		3 24.5 -59.9	132.9		2 43.6 -59.9	132.9		2 02.7 -59.9	133.0		1 21.8 -59.9	133.0		0 40.9 -60.0	133.0		0 00.0 +60.0	47.0		0
1	3 46.3 -59.8	132.9		3 05.5 -59.9	132.9		2 24.6 -59.9	133.0		1 43.7 -59.9	133.0		1 02.8 -60.0	133.0		0 21.9 -60.0	133.0		0 19.1 +60.0	47.0		1 00.0 +60.0	47.0		1
2	2 46.5 -59.7	133.0		2 05.6 -59.8	133.0		1 24.7 -59.9	133.0		0 43.8 -60.0	133.0		0 38.1 +60.0	47.0		1 19.1 +60.0	47.0		2 00.0 +60.0	47.0		2 00.0 +60.0	47.0		2
3	1 46.8 -59.8	133.1		1 05.8 -59.8	133.1		0 24.8 -59.9	133.1		0 16.2 +59.9	46.9		0 57.1 +60.0	46.9		1 57.1 +60.0	46.9		2 38.1 +60.0	46.9		3 19.1 +60.0	47.0		3
4	0 47.0 -59.7	133.1		0 06.0 -59.8	133.1		0 35.1 +59.8	46.9		1 16.1 +59.9	46.9		1 57.1 +60.0	46.9		2 38.1 +60.0	46.9		3 19.1 +60.0	47.0		4 00.0 +60.0	47.0		4
5	0 12.7 +59.8	46.8		0 53.8 +59.9	46.8		1 34.9 +59.9	46.8		2 16.0 +59.9	46.8		2 57.1 +59.9	46.8		3 38.1 +60.0	46.9		4 19.1 +60.0	46.9		5 00.0 +60.0	47.0		5
6	1 12.5 +59.8	46.7		1 53.7 +59.8	46.7		2 34.8 +59.9	46.7		3 15.9 +59.9	46.8		3 57.0 +60.0	46.8		4 38.1 +59.9	46.9		5 19.1 +59.9	46.9		6 00.0 +60.0	47.0		6
7	2 12.3 +59.7	46.6		2 53.5 +59.8	46.6		3 34.7 +59.9	46.7		4 15.8 +60.0	46.7		4 57.0 +59.9	46.8		5 38.0 +60.0	46.8		6 19.0 +60.0	46.9		7 00.0 +60.0	47.0		7
8	3 12.0 +59.8	46.5		3 53.3 +59.8	46.5		4 34.6 +59.8	46.6		5 15.8 +59.9	46.7		5 56.9 +60.0	46.7		6 38.0 +60.0	46.8		7 19.0 +60.0	46.9		8 00.0 +60.0	47.0		8
9	4 11.8 +59.7	46.4		4 53.1 +59.9	46.5		5 34.4 +59.9	46.5		6 15.7 +59.9	46.6		6 56.9 +59.9	46.7		7 38.0 +60.0	46.8		8 19.0 +60.0	46.9		9 00.0 +60.0	47.0		9
10	5 11.5 +59.8	46.3		5 53.0 +59.8	46.4		6 34.3 +59.9	46.5		7 15.6 +59.9	46.6		7 56.8 +60.0	46.7		8 38.0 +60.0	46.8		9 19.0 +60.0	46.9		10 00.0 +60.0	47.0		10
11	6 11.3 +59.8	46.2		6 52.8 +59.8	46.3		7 34.2 +59.9	46.4		8 15.5 +59.9	46.5		8 56.8 +59.9	46.6		9 38.0 +59.9	46.7		10 19.0 +60.0	46.9		11 00.0 +60.0	47.0		11
12	7 11.1 +59.7	46.1		7 52.6 +59.8	46.2		8 34.1 +59.8	46.3		9 15.4 +60.0	46.5		9 56.7 +60.0	46.6		10 37.9 +60.0	46.7		11 19.0 +60.0	46.8		12 00.0 +60.0	47.0		12
13	8 10.8 +59.8	46.0		8 52.4 +59.8	46.2		9 33.9 +59.9	46.3		10 15.4 +59.9	46.4		10 56.7 +59.9	46.5		11 37.9 +60.0	46.7		12 19.0 +60.0	46.8		13 00.0 +60.0	47.0		13
14	9 10.6 +59.7	46.0		9 52.2 +59.9	46.1		10 33.8 +59.9	46.2		11 15.3 +59.9	46.3		11 56.6 +60.0	46.5		12 37.9 +60.0	46.7		13 19.0 +60.0	46.8		14 00.0 +60.0	47.0		14
15	10 10.3 +59.8	45.9		10 52.1 +59.8	46.0		11 33.7 +59.9	46.1		12 15.2 +59.9	46.3		12 56.6 +60.0	46.5		13 37.9 +59.9	46.6		14 19.0 +60.0	46.8		15 00.0 +60.0	47.0		15
16	11 10.1 +59.7	45.8		11 51.9 +59.8	45.9		12 33.6 +59.8	46.1		13 15.1 +59.9	46.2		13 56.6 +59.9	46.4		14 37.8 +60.0	46.6		15 19.0 +60.0	46.8		16 00.0 +60.0	47.0		16
17	12 09.8 +59.8	45.7		12 51.7 +59.8	45.8		13 33.4 +59.9	46.0		14 15.0 +60.0	46.2		14 56.5 +60.0	46.4		15 37.8 +60.0	46.6		16 19.0 +60.0	46.8		17 00.0 +60.0	47.0		17
18	13 09.6 +59.7	45.6		13 51.5 +59.8	45.8		14 33.3 +59.9	45.9		15 15.0 +59.9	46.1		15 56.5 +59.9	46.3		16 37.8 +60.0	46.5		17 19.0 +60.0	46.8		18 00.0 +60.0	47.0		18
19	14 09.3 +59.8	45.5		14 51.3 +59.8	45.7		15 33.2 +59.8	45.9		16 14.9 +59.9	46.1		16 56.4 +60.0	46.3		17 37.8 +60.0	46.5		18 19.0 +60.0	46.8		19 00.0 +60.0	47.0		19
20	15 09.1 +59.7	45.4		15 51.1 +59.8	45.6		16 33.0 +59.9	45.8		17 14.8 +59.9	46.0		17 56.4 +59.9	46.3		18 37.8 +59.9	46.5		19 19.0 +60.0	46.7		20 00.0 +60.0	47.0		20
21	16 08.8 +59.8	45.3		16 50.9 +59.9	45.5		17 32.9 +59.9	45.7		18 14.7 +59.9	46.0		18 56.3 +60.0	46.2		19 37.7 +60.0	46.5		20 19.0 +60.0	46.7		21 00.0 +60.0	47.0		21
22	17 08.6 +59.7	45.2		17 50.8 +59.8	45.4		18 32.8 +59.8	45.7		19 14.6 +59.9	45.9		19 56.3 +59.9	46.2		20 37.7 +60.0	46.4		21 19.0 +60.0	46.7		22 00.0 +60.0	47.0		22
23	18 08.3 +59.7	45.1		18 50.6 +59.8	45.3		19 32.6 +59.9	45.6		20 14.5 +59.9	45.9		20 56.2 +60.0	46.1		21 37.7 +60.0	46.4		22 19.0 +60.0	46.7		23 00.0 +60.0	47.0		23
24	19 08.0 +59.8	45.0		19 50.4 +59.8	45.3		20 32.5 +59.9	45.5		21 14.4 +59.9	45.8		21 56.2 +59.9	46.1		22 37.7 +60.0	46.4		23 19.0 +60.0	46.7		24 00.0 +60.0	47.0		24
25	20 07.8 +59.7	44.9		20 50.2 +59.8	45.2		21 32.4 +59.8	45.4		22 14.3 +60.0	45.7		22 56.1 +60.0	46.0		23 37.7 +59.9	46.3		24 19.0 +59.9	46.7		25 00.0 +60.0	47.0		25
26	21 07.5 +59.7	44.8		21 50.0 +59.8	45.1		22 32.2 +59.9	45.4		23 14.3 +59.9	45.7		23 56.1 +59.9	46.0		24 37.6 +60.0	46.3		25 18.9 +60.0	46.6		26 00.0 +60.0	47.0		26
27	22 07.2 +59.7	44.7		22 49.8 +59.7	45.0		23 32.1 +59.8	45.3		24 14.2 +59.9	45.6		24 56.0 +60.0	45.9		25 37.6 +60.0	46.3		26 18.9 +60.0	46.6		27 00.0 +60.0	47.0		27
28	23 06.9 +59.7	44.6		23 49.5 +59.8	44.9		24 31.9 +59.8	45.2		25 14.1 +59.9	45.6		25 56.0 +59.9	45.9		26 37.6 +60.0	46.2		27 18.9 +60.0	46.6		28 00.0 +60.0	47.0		28
29	24 06.6 +59.8	44.5		24 49.3 +59.8	44.8		25 31.8 +59.8	45.1		26 14.0 +59.9	45.5		26 55.9 +59.9	45.8		27 37.6 +59.9	46.2		28 18.9 +60.0	46.6		29 00.0 +60.0	47.0		29
30	25 06.4 +59.7	44.4		25 49.1 +59.8	44.7		26 31.6 +59.9	45.1		27 13.9 +59.9	45.4		27 55.8 +60.0	45.8		28 37.5 +60.0	46.2		29 18.9 +60.0	46.6		30 00.0 +60.0	47.0		30
31	26 06.1 +59.7	44.3		26 48.9 +59.8	44.6		27 31.5 +59.8	45.0		28 13.8 +59.9	45.4		28 55.8 +59.9	45.7		29 37.5 +60.0	46.2		30 18.9 +60.0	46.6		31 00.0 +60.0	47.0		31
32	27 05.8 +59.7	44.2		27 48.7 +59.7	44.5		28 31.3 +59.8	44.9		29 13.7 +59.9	45.3		29 55.7 +60.0	45.7		30 37.5 +60.0	46.1		31 18.9 +60.0	46.6		32 00.0 +60.0	47.0		32
33	28 05.5 +59.7	44.0		28 48.4 +59.8	44.4		29 31.2 +59.8	44.8		30 13.6 +59.9	45.2		30 55.7 +59.9	45.6		31 37.5 +59.9	46.1		32 18.9 +60.0	46.5		33 00.0 +60.0	47.0		33
34	29 05.2 +59.6	43.9		29 48.2 +59.8	44.3		30 31.0 +59.8	44.7		31 13.5 +59.9	45.2		31 55.6 +59.9	45.6		32 37.4 +60.0	46.0		33 18.9 +60.0	46.5		34 00.0 +60.0	47.0		34
35	30 04.8 +59.7	43.8		30 48.0 +59.7	44.2		31 30.8 +59.9	45.1		32 13.4 +59.8	45.4		32 55.5 +60.0	45.5		33 37.4 +60.0	46.0		34 18.9 +60.0	46.5		35 00.0 +60.0	47.0		35
36	31 04.5 +59.7	43.7		31 47.7 +59.8	44.1		32 30.7 +59.8	44.6		33 13.2 +59.9	45.0		33 55.5 +59.9	45.5		34 37.4 +59.9	46.0		35 18.9 +60.0	46.5		36 00.0 +60.0	47.0		36
37	32 04.2 +59.6	43.6		32 47.5 +59.7	44.0		33 29.5 +59.8	44.5		34 13.1 +59.9	44.9		34 55.4 +60.0	45.4		35 37.3 +60.0	45.9		36 18.9 +60.0	46.5		37 00.0 +60.0	47.0		37
38	33 03.8 +59.7																								

48°, 312° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.				
Dec.	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	Dec.				
0	4	40.6	+59.8	131.8	4	00.6	+59.9	131.8	3	20.6	+59.9	131.9	2	40.5	+59.9	131.9	2	00.4	+60.0	132.0	1	20.3	+60.0	132.0	0	00.0	+60.0	132.0	0
1	5	40.4	+59.7	131.7	5	00.5	+59.8	131.8	4	20.5	+59.8	131.8	3	40.4	+60.0	131.9	3	00.4	+59.9	131.9	2	20.3	+59.9	132.0	1	40.1	+60.0	132.0	1
2	6	40.1	+59.8	131.6	6	00.3	+59.8	131.7	5	20.3	+59.9	131.8	4	40.4	+59.9	131.8	4	00.3	+60.0	131.9	3	20.2	+60.0	131.9	2	00.0	+60.0	132.0	2
3	7	39.9	+59.7	131.5	7	00.1	+59.8	131.6	6	20.2	+59.9	131.7	5	40.3	+59.9	131.8	4	20.2	+60.0	131.9	3	40.1	+60.0	132.0	3	00.0	+60.0	132.0	3
4	8	39.6	+59.8	131.4	7	59.9	+59.8	131.5	7	20.1	+59.9	131.6	6	40.2	+59.9	131.7	6	00.2	+60.0	131.8	5	20.2	+60.0	131.9	4	00.0	+60.0	132.0	4
5	9	39.4	+59.7	131.3	8	59.7	+59.8	131.4	8	20.0	+59.8	131.6	7	40.1	+59.9	131.7	7	00.2	+59.9	131.8	6	20.2	+60.0	131.9	5	00.0	+60.0	132.0	5
6	10	39.1	+59.8	131.2	9	59.5	+59.8	131.4	9	19.8	+59.9	131.5	8	40.0	+59.9	131.6	8	00.1	+60.0	131.7	7	20.2	+59.9	131.8	6	00.0	+60.0	132.0	6
7	11	38.9	+59.7	131.1	10	59.4	+59.8	131.3	10	19.7	+59.9	131.4	9	39.9	+60.0	131.6	9	00.1	+59.9	131.7	8	20.1	+60.0	131.8	7	00.0	+60.0	132.0	7
8	12	38.6	+59.8	131.0	11	59.2	+59.8	131.2	11	19.6	+59.8	131.4	10	39.9	+59.9	131.5	10	00.0	+60.0	131.6	9	20.1	+60.0	131.8	8	00.0	+60.0	132.0	8
9	13	38.4	+59.7	130.9	12	59.0	+59.8	131.1	12	19.4	+59.9	131.3	11	39.8	+59.9	131.5	11	00.0	+60.0	131.6	10	20.1	+60.0	131.7	9	00.0	+60.0	132.0	9
10	14	38.1	+59.7	130.9	13	58.8	+59.8	131.0	13	19.3	+59.9	131.2	12	39.7	+59.9	131.4	12	00.0	+59.9	131.6	11	20.1	+60.0	131.7	10	40.1	+60.0	131.9	10
11	15	37.8	+59.8	130.8	14	58.6	+59.8	131.0	14	19.2	+59.8	131.2	13	39.6	+59.9	131.3	12	59.9	+60.0	131.5	12	20.1	+59.9	131.7	11	40.1	+60.0	131.9	11
12	16	37.6	+59.7	130.7	15	58.4	+59.8	130.9	15	19.0	+59.9	131.1	14	39.5	+59.9	131.3	13	59.9	+59.9	131.5	13	20.0	+60.0	131.7	12	40.1	+60.0	131.8	12
13	17	37.3	+59.7	130.6	16	58.2	+59.8	130.8	16	18.9	+59.9	131.0	15	39.4	+60.0	131.2	14	59.8	+60.0	131.4	14	20.0	+60.0	131.6	13	40.1	+60.0	131.8	13
14	18	37.0	+59.8	130.5	17	58.0	+59.8	130.7	17	18.8	+59.8	130.9	16	39.4	+59.9	131.2	15	59.8	+59.9	131.4	15	20.0	+60.0	131.6	14	40.1	+60.0	132.0	14
15	19	36.8	+59.7	130.4	18	57.8	+59.8	130.6	18	18.6	+59.9	130.9	17	39.3	+59.9	131.1	16	59.7	+60.0	131.4	16	20.0	+60.0	131.6	15	40.1	+60.0	131.8	15
16	20	36.5	+59.7	130.3	19	57.6	+59.8	130.5	19	18.5	+59.8	130.8	18	39.2	+59.9	131.1	17	59.7	+59.9	131.3	17	20.0	+59.9	131.6	16	40.1	+60.0	131.8	16
17	21	36.2	+59.7	130.1	20	57.4	+59.8	130.4	20	18.3	+59.9	130.7	19	39.1	+59.9	131.0	18	59.6	+60.0	131.3	18	19.9	+60.0	131.5	17	40.1	+60.0	131.8	17
18	22	35.9	+59.7	130.0	21	57.2	+59.8	130.4	21	18.2	+59.9	130.7	20	39.0	+59.9	130.9	19	59.6	+59.9	131.2	19	19.9	+60.0	131.5	18	40.1	+59.9	131.8	18
19	23	35.6	+59.7	129.9	22	57.0	+59.7	130.3	22	18.1	+59.8	130.6	21	38.9	+59.9	130.9	20	59.5	+60.0	131.2	20	19.9	+60.0	131.5	19	40.0	+60.0	132.0	19
20	24	35.3	+59.7	129.8	23	56.7	+59.8	130.2	23	17.9	+59.9	130.5	22	38.8	+59.9	130.8	21	59.5	+59.9	131.1	21	19.9	+59.9	131.4	20	40.0	+60.0	131.7	20
21	25	35.0	+59.7	129.7	24	56.5	+59.8	130.1	24	17.8	+59.8	130.4	23	38.7	+59.9	130.8	22	59.4	+59.9	131.1	22	19.8	+60.0	131.4	21	40.0	+60.0	131.7	21
22	26	34.7	+59.7	129.6	25	56.3	+59.8	130.0	25	17.6	+59.8	130.4	24	38.6	+59.9	130.7	23	59.3	+60.0	131.0	23	19.8	+60.0	131.3	22	40.0	+60.0	131.7	22
23	27	34.4	+59.7	129.5	26	56.1	+59.7	129.9	26	17.4	+59.9	130.3	25	38.5	+59.9	130.6	24	59.3	+59.9	131.0	24	19.8	+60.0	131.3	23	40.0	+60.0	132.0	23
24	28	34.1	+59.7	129.4	27	55.8	+59.8	129.8	27	17.3	+59.8	130.2	26	38.4	+59.9	130.5	25	59.2	+60.0	131.0	25	19.8	+59.9	131.3	24	40.0	+60.0	132.0	24
25	29	33.8	+59.6	129.3	28	55.6	+59.8	129.7	28	17.1	+59.9	130.1	27	38.3	+59.9	130.5	26	59.2	+59.9	130.9	26	19.7	+60.0	131.3	25	40.0	+60.0	132.0	25
26	30	33.4	+59.7	129.1	29	55.4	+59.7	129.6	29	17.0	+59.8	130.0	28	38.2	+59.9	130.4	27	59.1	+60.0	130.9	27	19.7	+60.0	131.2	26	40.0	+60.0	132.0	26
27	31	33.1	+59.6	129.0	30	55.1	+59.8	129.5	30	16.8	+59.8	129.9	29	38.1	+59.9	130.4	28	59.1	+59.9	130.8	28	19.7	+60.0	131.2	27	40.0	+60.0	132.0	27
28	32	32.7	+59.7	128.9	31	54.9	+59.7	129.4	31	16.6	+59.8	129.8	30	38.0	+59.9	130.3	29	59.0	+59.9	130.8	29	19.7	+59.9	131.2	28	40.0	+60.0	132.0	28
29	33	32.4	+59.6	128.8	32	54.6	+59.8	129.3	32	16.5	+59.8	129.8	31	37.9	+59.9	130.2	30	58.9	+60.0	130.7	30	19.6	+60.0	131.1	29	40.0	+60.0	132.0	29
30	34	32.0	+59.7	128.6	33	54.4	+59.7	129.2	33	16.3	+59.8	129.7	32	37.8	+59.9	130.2	31	58.9	+59.9	130.6	31	19.6	+60.0	131.1	30	40.0	+60.0	132.0	30
31	35	31.7	+59.6	128.5	34	54.1	+59.7	129.0	34	16.1	+59.8	129.6	33	37.7	+59.8	130.1	32	58.8	+59.9	130.6	32	19.6	+60.0	131.1	31	40.0	+60.0	132.0	31
32	36	31.3	+59.6	128.4	35	53.8	+59.7	128.9	35	15.9	+59.8	129.5	34	37.5	+59.9	130.0	33	58.7	+60.0	130.5	33	19.6	+59.9	131.0	32	40.0	+60.0	132.0	32
33	37	30.9	+59.6	128.2	36	53.5	+59.8	128.8	36	15.7	+59.8	129.4	35	37.4	+59.9	129.9	34	58.7	+60.0	131.0	34	19.5	+60.0	131.5	33	40.0	+60.0	132.0	33
34	38	30.5	+59.6	128.1	37	53.3	+59.7	128.7	37	15.5	+59.8	129.3	36	37.3	+59.9	129.8	35	58.6	+60.0	130.4	35	19.5	+60.0	131.0	34	40.0	+60.0	132.0	34
35	39	30.1	+59.6	127.9	38	53.0	+59.7	128.6	37	15.2	+59.8	129.8	36	38.5	+60.0	130.4	36	19.5	+59.9	130.9	35	39.9	+60.0	131.5	35	40.0	+60.0	132.0	35
36	40	29.7	+59.5	127.8	39	52.7	+59.6	128.4	39	15.1	+59.8	129.1	38	37.0	+59.9	129.7	37	58.5	+60.0	130.3	37	19.4	+60.0	131.5	36	40.0	+60.0	132.0	36
37	41	29.2	+59.6	127.6	40	52.3	+59.7	128.3</																					

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $48^\circ$ ,  $312^\circ$

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
	Hc	d	Z	Hc	d	Z																			
0	4 40.6	-59.7	131.8	4 00.6	-59.8	131.8	3 20.6	-59.9	131.9	2 40.5	-59.9	131.9	2 00.4	-59.9	132.0	1 20.3	-60.0	132.0	0 40.1	-59.9	132.0	0 0.0	+60.0	48.0	0
1	3 40.9	-59.8	131.9	3 00.8	-59.8	131.9	2 20.7	-59.8	132.0	1 40.6	-59.9	132.0	1 00.5	-60.0	132.0	0 20.3	-60.0	132.0	0 19.8	+60.0	48.0	1 0.0	+60.0	48.0	1
2	2 41.1	-59.7	132.0	2 01.0	-59.8	132.0	1 20.9	-59.9	132.0	0 40.7	-59.9	132.0	0 0.5	-60.0	132.0	0 39.7	+60.0	48.0	1 19.8	+60.0	48.0	2 0.0	+60.0	48.0	2
3	1 41.4	-59.8	132.1	1 01.2	-59.8	132.1	0 21.0	-59.9	132.1	0 19.2	+60.0	47.9	0 59.5	+59.9	47.9	1 39.7	+59.9	47.9	2 19.8	+60.0	48.0	3 0.0	+60.0	48.0	3
4	0 41.6	-59.7	132.2	0 01.4	-59.8	132.2	0 38.9	+59.9	47.8	1 19.2	+59.9	47.9	1 59.4	+60.0	47.9	2 39.6	+60.0	47.9	3 19.8	+60.0	48.0	4 0.0	+60.0	48.0	4
5	0 18.1	+59.8	47.8	0 58.4	+59.9	47.8	1 38.8	+59.8	47.8	2 19.1	+59.9	47.8	2 59.4	+59.9	47.8	3 39.6	+60.0	47.9	4 19.8	+60.0	47.9	5 0.0	+60.0	48.0	5
6	1 17.9	+59.7	47.7	1 58.3	+59.8	47.7	2 38.6	+59.9	47.7	3 19.0	+59.9	47.8	3 59.3	+60.0	47.8	4 39.6	+60.0	47.9	5 19.8	+60.0	47.9	6 0.0	+60.0	48.0	6
7	2 17.6	+59.8	47.6	2 58.1	+59.8	47.6	3 38.5	+59.9	47.7	4 18.9	+59.9	47.7	4 59.3	+59.9	47.8	5 39.6	+60.0	47.8	6 19.8	+60.0	47.9	7 0.0	+60.0	48.0	7
8	3 17.4	+59.7	47.5	3 57.9	+59.8	47.5	4 38.4	+59.8	47.6	5 18.8	+60.0	47.7	5 59.2	+60.0	47.7	6 39.6	+59.9	47.8	7 19.8	+60.0	47.9	8 0.0	+60.0	48.0	8
9	4 17.1	+59.8	47.4	4 57.7	+59.8	47.5	5 38.3	+59.8	47.5	6 18.8	+59.9	47.6	6 59.2	+59.9	47.7	7 39.5	+60.0	47.8	8 19.8	+60.0	47.9	9 0.0	+60.0	48.0	9
10	5 16.9	+59.7	47.3	5 57.5	+59.9	47.4	6 38.1	+59.9	47.5	7 18.7	+59.9	47.5	7 59.1	+60.0	47.6	8 39.5	+60.0	47.8	9 19.8	+60.0	47.9	10 0.0	+60.0	48.0	10
11	6 16.6	+59.8	47.2	6 57.4	+59.8	47.3	7 38.0	+59.9	47.4	8 18.6	+59.9	47.5	8 59.1	+59.9	47.6	9 39.5	+60.0	47.7	10 19.8	+60.0	47.9	11 0.0	+60.0	48.0	11
12	7 16.4	+59.7	47.1	7 57.2	+59.8	47.2	8 37.9	+59.9	47.3	9 18.5	+59.9	47.4	9 59.0	+60.0	47.6	10 39.5	+59.9	47.7	11 19.8	+60.0	47.8	12 0.0	+60.0	48.0	12
13	8 16.1	+59.8	47.0	8 57.0	+59.8	47.1	9 37.8	+59.8	47.3	10 18.4	+59.9	47.4	10 59.0	+59.9	47.5	11 39.4	+60.0	47.7	12 19.8	+60.0	47.8	13 0.0	+60.0	48.0	13
14	9 15.9	+59.7	46.9	9 56.8	+59.8	47.1	10 37.6	+59.9	47.2	11 18.3	+60.0	47.3	11 58.9	+60.0	47.5	12 39.4	+60.0	47.6	13 19.8	+60.0	47.8	14 0.0	+60.0	48.0	14
15	10 15.6	+59.8	46.8	10 56.6	+59.8	47.0	11 37.5	+59.9	47.1	12 18.3	+59.9	47.3	12 58.9	+59.9	47.4	13 39.4	+60.0	47.6	14 19.8	+60.0	47.8	15 0.0	+60.0	48.0	15
16	11 15.4	+59.7	46.7	11 56.4	+59.8	46.9	12 37.4	+59.8	47.1	13 18.2	+59.9	47.2	13 58.8	+60.0	47.4	14 39.4	+60.0	47.6	15 19.8	+60.0	47.8	16 0.0	+60.0	48.0	16
17	12 15.1	+59.8	46.7	12 56.2	+59.8	46.8	13 37.2	+59.9	47.0	14 18.1	+59.9	47.2	14 58.8	+60.0	47.4	15 39.4	+59.9	47.6	16 19.8	+60.0	47.8	17 0.0	+60.0	48.0	17
18	13 14.9	+59.7	46.6	13 56.0	+59.8	46.7	14 37.1	+59.9	46.9	15 18.0	+59.9	47.1	15 58.8	+59.9	47.3	16 39.3	+60.0	47.5	17 19.8	+60.0	47.8	18 0.0	+60.0	48.0	18
19	14 14.6	+59.7	46.5	14 55.8	+59.9	46.7	15 37.0	+59.8	46.9	16 17.9	+59.9	47.1	16 58.7	+60.0	47.3	17 39.3	+60.0	47.5	18 19.8	+59.9	47.7	19 0.0	+60.0	48.0	19
20	15 14.3	+59.8	46.4	15 55.7	+59.8	46.6	16 36.8	+59.9	46.8	17 17.8	+59.9	47.0	17 58.7	+59.9	47.2	18 39.3	+60.0	47.5	19 19.7	+60.0	47.7	20 0.0	+60.0	48.0	20
21	16 14.1	+59.7	46.3	16 55.5	+59.8	46.5	17 36.7	+59.8	46.7	18 17.7	+59.9	46.9	18 58.6	+59.9	47.2	19 39.3	+60.0	47.5	20 19.7	+60.0	47.7	21 0.0	+60.0	48.0	21
22	17 13.8	+59.7	46.2	17 55.3	+59.8	46.4	18 36.5	+59.9	46.6	19 17.6	+60.0	46.9	19 58.5	+60.0	47.2	20 39.3	+59.9	47.4	21 19.7	+60.0	47.7	22 0.0	+60.0	48.0	22
23	18 13.5	+59.7	46.1	18 55.1	+59.8	46.3	19 36.4	+59.9	46.6	20 17.6	+59.9	46.8	20 58.5	+59.9	47.1	21 39.2	+60.0	47.4	22 19.7	+60.0	47.7	23 0.0	+60.0	48.0	23
24	19 13.2	+59.8	46.0	19 54.9	+59.7	46.2	20 36.3	+59.8	46.5	21 17.5	+59.9	46.8	21 58.4	+60.0	47.1	22 39.2	+60.0	47.4	23 19.7	+60.0	47.7	24 0.0	+60.0	48.0	24
25	20 13.0	+59.7	45.9	20 54.6	+59.8	46.1	21 36.1	+59.9	46.4	22 17.4	+59.9	46.7	22 58.4	+59.9	47.0	23 39.2	+60.0	47.3	24 19.7	+60.0	47.7	25 0.0	+60.0	48.0	25
26	21 12.7	+59.7	45.8	21 54.4	+59.8	46.0	22 36.0	+59.8	46.3	23 17.3	+59.9	46.7	23 58.3	+60.0	47.0	24 39.2	+59.9	47.3	25 19.7	+60.0	47.6	26 0.0	+60.0	48.0	26
27	22 12.4	+59.7	45.7	22 54.2	+59.8	46.0	23 35.8	+59.9	46.3	24 17.2	+59.9	46.6	24 58.3	+59.9	46.9	25 39.1	+60.0	47.3	26 19.7	+60.0	47.6	27 0.0	+60.0	48.0	27
28	23 12.1	+59.7	45.6	23 54.0	+59.8	45.9	24 35.7	+59.8	46.2	25 17.1	+59.9	46.5	25 58.2	+60.0	46.9	26 39.1	+60.0	47.2	27 19.7	+60.0	47.6	28 0.0	+60.0	48.0	28
29	24 11.8	+59.7	45.4	24 53.8	+59.8	45.8	25 35.5	+59.9	46.1	26 17.0	+59.9	46.5	26 58.2	+59.9	46.8	27 39.1	+60.0	47.2	28 19.7	+60.0	47.6	29 0.0	+60.0	48.0	29
30	25 11.5	+59.7	45.3	25 53.6	+59.7	45.7	26 35.4	+59.8	46.0	27 16.9	+59.9	46.4	27 58.1	+60.0	46.8	28 39.1	+59.9	47.2	29 19.7	+60.0	47.6	30 0.0	+60.0	48.0	30
31	26 11.2	+59.7	45.2	26 53.3	+59.8	45.6	27 35.2	+59.8	45.9	28 16.8	+59.9	46.3	28 58.1	+59.9	46.7	29 39.0	+60.0	47.1	30 19.7	+60.0	47.6	31 0.0	+60.0	48.0	31
32	27 10.9	+59.7	45.1	27 53.1	+59.8	45.5	28 35.0	+59.9	45.9	29 16.7	+59.9	46.3	29 58.0	+59.9	46.7	30 39.0	+60.0	47.1	31 19.7	+60.0	47.5	32 0.0	+60.0	48.0	32
33	28 10.6	+59.7	45.0	28 52.9	+59.7	45.4	29 34.9	+59.8	45.8	30 16.6	+59.9	46.2	30 57.9	+60.0	46.6	31 39.0	+59.9	47.1	32 19.7	+60.0	47.5	33 0.0	+60.0	48.0	33
34	29 10.3	+59.6	44.9	29 52.6	+59.8	45.3	30 34.7	+59.8	45.7	31 16.5	+59.8	46.1	31 57.9	+59.9	46.3	32 38.9	+60.0	47.0	33 19.7	+60.0	47.5	34 0.0	+60.0	48.0	34
35	30 0.9	+59.7	44.8	30 52.4	+59.7	45.2	31 34.5	+59.9	45.6	32 16.3	+59.8	46.1	32 57.8	+59.9	46.5	33 38.9	+60.0	47.0	34 19.7	+59.9	47.5	35 0.0	+60.0	48.0	35
36	31 0.6	+59.7	44.6	31 52.1	+59.8	45.1	32 34.4	+59.8	45.5	33 16.2	+59.9	46.0	33 57.7	+60.0	46.5	34 38.9	+60.0	47.0	35 19.6	+60.0	47.5	36 0.0	+60.0	48.0	36
37	32 0.3	+59.6	44.5	32 51.9	+59.7	45.0	33 34.2	+59.8	45.4	34 16.1	+59.9	45.9	34 57.7	+59.9	46.4	35 38.9	+59.9	46.9	36 19.6	+60.0	47.4	37 0.0	+60.0	48.0	37
38	33 0.8	+59.7	44.4	33 51.6	+59.8	44.																			

49°, 311° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.																				
Dec.	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Dec.																				
0	4 35.2 + 59.7 130.8	3 55.9 + 59.8 130.8	3 16.7 + 59.8 130.9	2 37.4 + 59.9 130.9	1 58.1 + 59.9 131.0	1 18.7 + 60.0 131.0	0 39.4 + 60.0 131.0	0 00.0 + 60.0 131.0	0	5 34.9 + 59.7 130.7	4 55.7 + 59.9 130.8	4 16.5 + 59.9 130.8	3 37.3 + 59.9 130.9	2 58.0 + 60.0 130.9	2 18.7 + 60.0 131.0	1 39.4 + 60.0 131.0	1 00.0 + 60.0 131.0	1	6 34.6 + 59.8 130.6	5 55.6 + 59.8 130.7	5 16.4 + 59.9 130.8	4 37.2 + 59.9 130.8	3 58.0 + 59.9 130.9	3 18.7 + 60.0 130.9	2 39.4 + 59.9 131.0	2 00.0 + 60.0 131.0	2	7 34.4 + 59.7 130.5	6 55.4 + 59.8 130.6	6 16.3 + 59.9 130.7	5 37.1 + 59.9 130.8	4 57.9 + 60.0 130.8	4 18.7 + 59.9 130.9	3 39.3 + 60.0 131.0	3 00.0 + 60.0 131.0	3	8 34.1 + 59.8 130.4	7 55.2 + 59.8 130.5	7 16.2 + 59.8 130.6	6 37.0 + 60.0 130.7	5 57.9 + 59.9 130.8	5 18.6 + 60.0 130.9	4 39.3 + 60.0 131.0	4 00.0 + 60.0 131.0	4
5	9 33.9 + 59.7 130.3	8 55.0 + 59.8 130.4	8 16.0 + 59.9 130.6	7 37.0 + 59.9 130.7	6 57.8 + 60.0 130.8	6 18.6 + 60.0 130.9	5 39.3 + 60.0 130.9	5 00.0 + 60.0 131.0	5	10 33.6 + 59.7 130.2	9 54.8 + 59.8 130.4	9 15.9 + 59.9 130.5	8 36.9 + 59.9 130.6	7 57.8 + 59.9 130.7	7 18.6 + 60.0 130.8	6 39.3 + 60.0 130.9	6 00.0 + 60.0 131.0	6	11 33.3 + 59.8 130.1	10 54.6 + 59.8 130.3	10 15.8 + 59.8 130.4	9 36.8 + 59.9 130.6	8 57.7 + 60.0 130.7	8 18.6 + 59.9 130.8	7 39.3 + 60.0 130.9	7 00.0 + 60.0 131.0	7	12 33.1 + 59.7 130.0	11 54.4 + 59.8 130.2	11 15.6 + 59.9 130.4	10 36.7 + 59.9 130.5	9 57.7 + 59.9 130.6	9 18.5 + 60.0 130.8	8 39.3 + 60.0 130.9	8 00.0 + 60.0 131.0	8	13 32.8 + 59.7 129.9	12 54.2 + 59.8 130.1	12 15.5 + 59.8 130.3	11 36.6 + 59.9 130.4	10 57.6 + 60.0 130.6	10 18.5 + 60.0 130.7	9 39.3 + 60.0 130.9	9 00.0 + 60.0 131.0	9
10	14 32.5 + 59.8 129.8	13 54.0 + 59.8 130.0	13 15.3 + 59.9 130.2	12 36.5 + 59.9 130.4	11 57.6 + 59.9 130.6	11 18.5 + 60.0 130.7	10 39.3 + 60.0 130.9	10 00.0 + 60.0 131.0	10	15 32.3 + 59.7 129.7	14 53.8 + 59.8 129.9	14 15.2 + 59.9 130.1	13 36.4 + 60.0 130.3	12 57.5 + 60.0 130.5	12 18.5 + 60.0 130.7	11 39.3 + 60.0 130.8	11 00.0 + 60.0 131.0	11	16 32.0 + 59.7 129.6	15 53.6 + 59.8 129.9	15 15.1 + 59.8 130.1	14 36.4 + 59.9 130.3	13 57.5 + 59.9 130.5	13 18.5 + 59.9 130.7	12 39.3 + 60.0 130.8	12 00.0 + 60.0 131.0	12	17 31.7 + 59.7 129.5	16 53.4 + 59.8 129.8	16 14.9 + 59.9 130.0	15 36.3 + 59.9 130.2	14 57.4 + 60.0 130.4	14 18.4 + 60.0 130.6	13 39.3 + 60.0 130.8	13 00.0 + 60.0 131.0	13	18 31.4 + 59.7 129.4	17 53.2 + 59.8 129.7	17 14.8 + 59.8 129.9	16 36.2 + 59.9 130.2	15 57.4 + 59.9 130.4	15 18.4 + 60.0 130.6	14 39.3 + 60.0 130.8	14 00.0 + 60.0 131.0	14
15	19 31.1 + 59.8 129.3	18 53.0 + 59.8 129.6	18 14.6 + 59.9 129.9	17 36.1 + 59.9 130.1	16 57.3 + 60.0 130.3	16 18.4 + 60.0 130.6	15 39.3 + 60.0 130.8	15 00.0 + 60.0 131.0	15	20 30.9 + 59.7 129.2	19 52.8 + 59.8 129.5	19 14.5 + 59.9 129.8	18 36.0 + 59.9 130.1	17 57.3 + 59.9 130.3	17 18.4 + 60.0 130.5	16 39.3 + 60.0 130.8	16 00.0 + 60.0 131.0	16	21 30.6 + 59.7 129.1	20 52.6 + 59.8 129.4	20 14.4 + 59.8 129.7	19 35.9 + 59.9 130.0	18 57.2 + 60.0 130.3	18 18.4 + 59.9 130.5	17 39.3 + 60.0 130.8	17 00.0 + 60.0 131.0	17	22 30.3 + 59.7 129.0	21 52.4 + 59.7 129.3	21 14.2 + 59.9 129.6	20 35.8 + 59.9 129.9	19 57.2 + 60.0 130.2	19 18.3 + 60.0 130.5	18 39.3 + 60.0 130.7	18 00.0 + 60.0 131.0	18	23 30.0 + 59.7 128.9	22 52.1 + 59.8 129.2	22 14.1 + 59.8 129.6	21 35.7 + 59.9 129.9	20 57.1 + 60.0 130.2	20 18.3 + 60.0 130.5	19 39.3 + 60.0 130.7	19 00.0 + 60.0 131.0	19
20	24 29.7 + 59.6 128.8	23 51.9 + 59.8 129.1	23 13.9 + 59.8 129.5	22 35.6 + 59.9 129.8	21 57.1 + 59.9 130.1	21 18.3 + 60.0 130.4	20 39.3 + 59.9 130.7	20 00.0 + 60.0 131.0	20	25 29.3 + 59.7 128.7	24 51.7 + 59.8 129.1	24 13.7 + 59.9 129.4	23 35.5 + 59.9 129.7	22 57.0 + 60.0 130.1	22 18.3 + 59.9 130.4	21 39.2 + 60.0 130.7	21 00.0 + 60.0 131.0	21	26 29.0 + 59.7 128.6	25 51.5 + 59.7 129.0	25 13.6 + 59.8 129.3	24 35.4 + 59.9 129.7	23 57.0 + 59.9 130.0	23 18.2 + 60.0 130.4	22 39.2 + 60.0 130.7	22 00.0 + 60.0 131.0	22	27 28.7 + 59.7 128.5	26 51.2 + 59.8 128.9	26 13.4 + 59.9 129.2	25 35.3 + 59.9 129.6	24 56.9 + 59.9 130.0	24 18.2 + 60.0 130.3	23 39.2 + 60.0 130.7	23 00.0 + 60.0 131.0	23	28 28.4 + 59.7 128.3	27 51.0 + 59.8 128.8	27 13.3 + 59.8 129.2	26 35.2 + 59.9 129.5	25 56.8 + 60.0 129.9	25 18.2 + 60.0 130.3	24 39.2 + 60.0 130.7	24 00.0 + 60.0 131.0	24
25	29 28.1 + 59.6 128.2	28 50.8 + 59.7 128.7	28 13.1 + 59.8 129.1	27 35.1 + 59.9 129.5	26 56.8 + 59.9 129.9	26 18.2 + 59.9 130.6	25 39.2 + 60.0 130.1	25 00.0 + 60.0 131.0	25	30 27.7 + 59.7 128.1	29 50.5 + 59.8 128.6	29 12.9 + 59.9 129.0	28 35.0 + 59.9 129.4	27 56.7 + 60.0 129.8	27 18.1 + 60.0 130.2	26 39.2 + 60.0 130.6	26 00.0 + 60.0 131.0	26	31 27.4 + 59.6 128.0	30 50.3 + 59.7 128.4	30 12.8 + 59.8 128.9	29 34.9 + 59.9 129.4	28 56.7 + 59.9 129.8	28 18.1 + 60.0 130.2	27 39.2 + 60.0 130.6	27 00.0 + 60.0 131.0	27	32 27.0 + 59.7 127.8	31 50.0 + 59.7 128.3	31 12.6 + 59.8 128.8	30 34.8 + 59.9 129.3	29 56.6 + 59.9 129.7	29 18.1 + 59.9 130.2	28 39.2 + 60.0 130.6	28 00.0 + 60.0 131.0	28	33 26.7 + 59.6 127.7	32 49.7 + 59.8 128.2	32 12.4 + 59.8 128.7	31 34.7 + 59.8 129.2	30 56.5 + 60.0 129.7	30 18.0 + 60.0 130.1	29 39.2 + 60.0 130.6	29 00.0 + 60.0 131.0	29
30	34 26.3 + 59.6 127.6	33 49.5 + 59.7 128.1	33 12.2 + 59.8 128.6	32 34.5 + 59.9 129.1	31 56.5 + 59.9 129.6	31 18.0 + 60.0 130.1	30 39.2 + 60.0 130.6	30 00.0 + 60.0 131.0	30	35 25.9 + 59.6 127.4	34 49.2 + 59.7 128.0	34 12.0 + 59.8 128.5	33 34.4 + 59.9 129.1	32 56.4 + 59.9 129.6	32 18.0 + 60.0 130.1	31 39.2 + 60.0 130.5	31 00.0 + 60.0 131.0	31	36 25.5 + 59.6 127.3	35 48.9 + 59.7 127.9	35 11.8 + 59.8 128.4	34 34.3 + 59.9 129.0	33 56.3 + 60.0 129.5	33 18.0 + 59.9 130.0	32 39.2 + 60.0 130.5	32 00.0 + 60.0 131.0	32	37 25.1 + 59.6 127.2	36 48.6 + 59.7 127.8	36 11.6 + 59.8 128.3	35 34.2 + 59.9 128.9	34 56.3 + 59.9 129.5	34 17.9 + 60.0 130.0	33 39.2 + 60.0 130.5	33 00.0 + 60.0 131.0	33	38 24.7 + 59.6 127.0	37 48.3 + 59.7 127.6	37 11.4 + 59.8 128.2	36 34.1 + 59.8 128.8	35 56.2 + 59.9 129.4	35 17.9 + 60.0 130.5	34 39.2 + 60.0 131.0	34 00.0 + 60.0 131.0	34
35	39 24.3 + 59.6 126.9	38 48.0 + 59.7 127.5	38 11.2 + 59.8 128.1	37 33.9 + 59.9 128.7	36 56.1 + 60.0 129.3	36 17.9 + 59.9 129.9	35 39.2 + 59.9 130.5	35 00.0 + 60.0 131.0	35	40 23.9 + 59.5 126.7	39 47.7 + 59.7 127.4	39 11.0 + 59.8 128.0	38 33.8 + 59.9 128.7	37 56.1 + 59.9 129.3	37 17.8 + 60.0 129.9	36 39.1 + 60.0 130.4	36 00.0 + 60.0 131.0	36	41 23.4 + 59.5 126.5	40 47.4 + 59.7 127.2	40 10.8 + 59.8 127.9	39 33.7 + 59.8 128.6	38 56.0 + 59.9 129.2	38 17.8 + 60.0 129.8	37 39.1 + 60.0 130.4	37 00.0 + 60.0 131.0	37	42 22.9 + 59.6 126.4	41 47.1 + 59.6 127.1	41 10.6 + 59.7 127.8	40 33.5 + 59.9 128.5	39 55.9 + 59.9 129.1	39 17.8 + 60.0 129.8	38 39.1 + 60.0 130.4	38 00.0 + 60.0 131.0	38	43 22.5 + 59.5 126.2	42 46.7 + 59.7 127.0	42 10.3 + 59.8 127.7	41 33.4 + 59.8 128.4	40 55.8 + 59.9 129.1	40 17.7 + 60.0 129.7	39 39.1 + 60.0 130.4	39 00.0 + 60.0 131.0	39
40	44 22.0 + 59.5 126.0	43 46.4 + 59.6 126.8	43 10.1 + 59.7 127.6	42 33.2 + 59.9 128.3	41 55.7 + 60.0 129.0	41 17.7 + 60.0 129.7	40 39.1 + 60.0 130.4	40 00.0 + 60.0 131.0	40	45 21.5 + 59.5 125.8	44 46.0 + 59.6 126.7	44 09.8 + 59.7 127.4	43 33.1 + 59.8 128.2	42 55.7 + 59.9 128.9	42 17.7 + 59.9 129.6	41 39.1 + 60.0 130.3	41 00.0 + 60.0 131.0	41	46 21.0 + 59.4 125.7	45 45.6 + 59.6 126.5	45 09.6 + 59.7 127.3	44 32.9 + 59.8 128.1	43 55.6 + 59.9 128.9	43 17.6 + 60.0 129.6	42 39.1 + 60.0 130.3	42 00.0 + 60.0 131.0	42	47 20.4 + 59.4 125.5	46 45.2 + 59.6 126.3	46 09.3 + 59.7 127.2	45 32.7 + 59.9 128.0	44 55.5 + 59.9 128.8	44 17.6 + 59.9 129.5	43 39.1 + 60.0 130.3	43 00.0 + 60.0 131.0	43	48 19.8 + 59.5 125.3	47 44.8 + 59.6 126.2	47 09.0 + 59.8 127.0	46 32.6 + 59.8 127.9	45 55.4 + 59.9 128.7	45 17.5 + 60.0 129.5	44 39.1 + 60.0 130.3	44 00.0 + 60.0 131.0	44
45	49 19.3 + 59.3 125.0	48 44.4 + 59.6 126.0	48 08.8 + 59.7 126.9	47 32.4 + 59.8 127.8	46 55.3 + 59.9 128.6	46 17.5 + 60.0 129.4	45 39.1 + 59.9 130.2	45 00.0 + 60.0 131.0	45	46 18.6 + 59.4 124.8	49 44.0 + 59.5 125.8	49 08.5 + 59.7 126.7	48 32.2 + 59.8 127.6	47 55.2 + 59.9 128.5	47 17.5 + 59.9 129.4	46 39.0 + 60.0 130.2	46 00.0 + 60.0 131.0	46	47 18.0 + 59.3 124.6	50 43.5 + 59.5 125.6	50 08.2 + 59.6 126.6	49 32.0 + 59.8 127.5	48 55.0 + 59.9 128.4	48 17.4 + 60.0 129.3	47 39.0 + 60.0 130.2	47 00.0 + 60.0 131.0	47	48 52.3 + 59.3 124.4	51 43.0 + 59.5 125.4	51 07.8 + 59.7 126.4	50 31.8 + 59.8 127.4	49 55.0 + 59.8 128.3	49 17.4 + 60												

**LATITUDE CONTRARY NAME TO DECLINATION**

**L.H.A. 49°, 311°**

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.				
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z					
0	○	,	○	○	,	○	○	,	○	○	,	○	○	,	○	○	,	○	○	,	○	○	,	○	○	,	○		
	4	35.2	-59.8	130.8	3	55.9	-59.8	130.8	3	16.7	-59.9	130.9	2	37.4	-59.9	130.9	1	58.1	-60.0	131.0	1	18.7	-60.0	131.0	0	39.4	-60.0	131.0	
	1	35.4	-59.7	130.9	2	56.1	-59.8	130.9	2	16.8	-59.9	131.0	1	37.5	-60.0	131.0	0	58.1	-59.9	131.0	0	18.7	-59.9	131.0	0	20.6	+60.0	49.0	
	2	35.7	-59.8	131.0	1	56.3	-59.8	131.0	1	16.9	-59.8	131.0	0	37.5	-59.9	131.0	0	01.8	+60.0	49.0	4	41.2	+60.0	49.0	2	20.6	+60.0	49.0	
	3	35.9	-59.7	131.1	0	56.5	-59.8	131.1	0	17.1	-59.9	131.1	0	22.4	+59.9	48.9	2	01.8	+60.0	49.0	2	41.2	+60.0	49.0	3	20.6	+60.0	49.0	
4	0	36.2	-59.8	131.2	0	03.3	+59.8	48.8	0	42.8	+59.9	48.8	1	22.3	+59.9	48.9	2	01.8	+59.9	48.9	2	41.2	+60.0	49.0	4	20.6	+60.0	49.0	
	5	0	23.6	+59.7	48.8	1	03.1	+59.8	48.8	1	42.7	+59.8	48.8	2	22.2	+59.9	48.8	3	01.7	+60.0	48.8	3	41.2	+60.0	48.9	5	20.6	+60.0	49.0
	6	1	23.3	+59.8	48.7	2	02.9	+59.9	48.7	2	42.5	+59.8	48.7	3	22.1	+59.9	48.8	4	01.7	+59.9	48.8	4	41.2	+59.9	48.9	6	20.6	+60.0	49.0
	7	2	23.1	+59.7	48.6	3	02.8	+59.8	48.6	3	42.4	+59.9	48.6	4	22.0	+60.0	48.7	5	01.6	+60.0	48.8	5	41.1	+60.0	48.8	7	20.6	+60.0	49.0
	8	3	22.8	+59.8	48.5	4	02.6	+59.8	48.5	4	42.3	+59.9	48.6	5	22.0	+59.9	48.6	6	01.6	+59.9	48.7	6	41.1	+60.0	48.9	8	20.6	+60.0	49.0
9	4	22.6	+59.7	48.4	5	02.4	+59.8	48.4	5	42.2	+59.8	48.5	6	21.9	+59.9	48.6	7	01.5	+60.0	48.7	7	41.1	+60.0	48.9	9	20.6	+60.0	49.0	
	10	5	22.3	+59.7	48.3	6	02.2	+59.8	48.4	6	42.0	+59.9	48.4	7	21.8	+59.9	48.5	8	01.5	+59.9	48.6	8	41.1	+60.0	48.8	9	20.6	+60.0	48.9
	11	6	22.0	+59.8	48.2	7	02.0	+59.8	48.3	7	41.9	+59.9	48.4	8	21.7	+59.9	48.5	9	01.4	+60.0	48.6	9	41.1	+59.9	48.7	10	20.6	+60.0	48.9
	12	7	21.8	+59.7	48.1	8	01.8	+59.8	48.2	8	41.8	+59.8	48.3	9	21.6	+59.9	48.4	10	01.4	+59.9	48.6	10	41.0	+60.0	48.7	11	20.6	+60.0	49.0
	13	8	21.5	+59.8	48.0	9	01.6	+59.8	48.1	9	41.6	+59.9	48.2	10	21.5	+59.9	48.4	11	01.3	+60.0	48.5	11	41.0	+60.0	48.7	12	20.6	+60.0	48.8
14	9	21.3	+59.7	47.9	10	01.4	+59.8	48.0	10	41.5	+59.9	48.2	11	21.4	+60.0	48.3	12	01.3	+59.9	48.5	12	41.0	+60.0	48.6	13	20.6	+60.0	48.8	
	15	10	21.0	+59.7	47.8	11	01.2	+59.8	48.0	11	41.4	+59.8	48.1	12	21.4	+59.9	48.3	13	01.2	+60.0	48.4	13	41.0	+59.9	48.6	14	20.6	+60.0	48.8
	16	11	20.7	+59.8	47.7	12	01.0	+59.8	47.9	12	41.2	+59.9	48.0	13	21.3	+59.9	48.2	14	01.2	+59.9	48.4	14	40.9	+60.0	48.6	15	20.6	+59.9	48.8
	17	12	20.5	+59.7	47.6	13	00.8	+59.8	47.8	13	41.1	+59.8	48.0	14	21.2	+59.9	48.2	15	01.1	+60.0	48.4	15	40.9	+60.0	48.6	16	20.5	+60.0	48.8
	18	13	20.2	+59.7	47.5	14	00.6	+59.8	47.7	14	40.9	+59.9	47.9	15	21.1	+59.9	48.1	16	01.1	+59.9	48.3	16	40.9	+60.0	48.5	17	20.5	+60.0	48.8
19	14	19.9	+59.8	47.4	15	00.4	+59.8	47.6	15	40.8	+59.9	47.8	16	21.0	+59.9	48.0	17	01.0	+60.0	48.3	17	40.9	+60.0	48.5	18	20.5	+60.0	49.0	
	20	15	19.7	+59.7	47.3	16	00.2	+59.8	47.5	16	40.7	+59.8	47.8	17	20.9	+59.9	48.0	18	01.0	+59.9	48.2	18	40.9	+59.9	48.5	19	20.5	+60.0	49.0
	21	16	19.4	+59.7	47.2	17	00.0	+59.8	47.5	17	40.5	+59.9	47.7	18	20.8	+59.9	47.9	19	00.9	+60.0	48.2	19	40.8	+60.0	48.4	20	20.5	+60.0	48.7
	22	17	19.1	+59.7	47.1	17	59.8	+59.8	47.4	18	40.4	+59.8	47.6	19	20.7	+59.9	47.9	20	00.9	+59.9	48.1	20	40.8	+60.0	48.4	21	20.5	+60.0	49.0
	23	18	18.8	+59.7	47.0	18	59.6	+59.8	47.3	19	40.2	+59.9	47.5	20	20.6	+59.9	47.8	21	00.8	+60.0	48.1	21	40.8	+60.0	48.4	22	20.5	+60.0	49.0
24	24	19.5	+59.8	46.9	19	59.4	+59.8	47.2	20	40.1	+59.8	47.5	21	20.5	+59.9	47.8	22	00.8	+59.9	48.0	22	40.8	+59.9	48.4	23	20.5	+60.0	49.0	
	25	20	18.3	+59.7	46.8	20	59.2	+59.8	47.1	21	39.9	+59.8	47.4	22	20.4	+59.9	47.7	23	00.7	+60.0	48.0	23	40.7	+60.0	48.3	24	20.5	+60.0	49.0
	26	21	18.0	+59.7	46.7	21	59.0	+59.8	47.0	22	39.8	+59.8	47.3	23	20.3	+59.9	47.6	24	00.7	+59.9	48.0	24	40.7	+60.0	48.3	25	20.5	+60.0	49.0
	27	22	17.7	+59.7	46.6	22	58.8	+59.7	46.9	23	39.6	+59.9	47.2	24	20.2	+59.9	47.6	25	00.6	+59.9	47.9	25	40.7	+60.0	48.6	26	20.5	+60.0	49.0
	28	23	17.4	+59.7	46.5	23	58.5	+59.8	46.8	24	39.5	+59.8	47.2	25	20.1	+59.9	47.5	26	00.5	+60.0	47.9	26	40.7	+60.0	48.6	27	20.5	+60.0	49.0
29	24	17.1	+59.7	46.4	24	58.3	+59.8	46.7	25	39.3	+59.9	47.1	26	20.0	+59.9	47.4	27	00.5	+59.9	47.8	27	40.6	+60.0	48.2	28	20.5	+60.0	49.0	
	30	25	16.8	+59.6	46.3	25	58.1	+59.8	46.6	26	39.2	+59.8	47.0	27	19.9	+59.9	47.4	28	00.4	+60.0	47.8	28	40.6	+60.0	48.2	29	20.5	+60.0	49.0
	31	26	16.4	+59.7	46.2	26	57.9	+59.7	46.5	27	39.0	+59.8	46.9	28	19.8	+59.9	47.3	29	00.4	+59.9	47.7	29	40.6	+60.0	48.6	31	20.5	+60.0	49.0
	32	27	16.1	+59.7	46.1	27	57.6	+59.8	46.4	28	38.8	+59.8	46.8	29	19.7	+59.9	47.2	30	00.3	+59.9	47.7	31	40.5	+60.0	48.1	32	20.5	+60.0	49.0
	33	28	15.8	+59.7	45.9	28	57.4	+59.7	46.3	29	38.6	+59.9	46.7	30	19.6	+59.9	47.2	31	00.2	+60.0	47.6	31	40.5	+60.0	48.5	33	20.4	+60.0	49.0
34	29	25	15.5	+59.6	45.8	29	57.1	+59.8	46.2	30	38.5	+59.8	46.7	31	19.5	+59.9	47.1	32	00.2	+59.9	47.5	32	40.5	+60.0	48.0	34	20.0	+60.0	49.0
	35	30	15.1	+59.7	45.7	30	56.9	+59.7	46.1	31	38.3	+59.8	46.6	32	19.4	+59.9	47.5	33	00.1	+59.9	47.5	33	40.5	+60.0	48.5	35	20.4	+60.0	49.0
	36	31	14.8	+59.6	45.6	31	56.6	+59.8	46.0	32	38.1	+59.8	46.5	33	19.3	+59.8	46.9	34	00.0	+60.0	47.4	34	40.4	+60.0	48.5	36	20.4	+60.0	49.0
	37	32	14.4	+59.7	45.4	32	56.4	+59.7	45.9	33	37.9	+59.8	46.4	34	19.1	+59.9													

50°, 310° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.				
Dec.	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	Dec.				
0	4	29.6	+59.7	129.8	3	51.2	+59.8	129.8	3	12.7	+59.9	129.9	2	34.2	+59.9	129.9	1	55.7	+59.9	130.0	1	17.1	+60.0	130.0	0	00.0	+60.0	130.0	0
1	5	29.3	+59.7	129.7	4	51.0	+59.8	129.8	4	12.6	+59.8	129.8	3	34.1	+59.9	129.9	2	55.6	+60.0	129.9	2	17.1	+60.0	130.0	1	38.6	+60.0	130.0	1
2	6	29.0	+59.8	129.6	5	50.8	+59.8	129.7	5	12.4	+59.9	129.8	4	34.0	+59.9	129.8	3	55.6	+59.9	129.9	3	17.1	+60.0	129.9	2	38.6	+59.9	130.0	2
3	7	28.8	+59.7	129.5	6	50.6	+59.8	129.6	6	12.3	+59.9	129.7	5	33.9	+60.0	129.8	4	55.5	+60.0	129.8	4	17.1	+59.9	129.9	3	38.5	+60.0	130.0	3
4	8	28.5	+59.7	129.4	7	50.4	+59.8	129.5	7	12.2	+59.8	129.6	6	33.9	+59.9	129.7	5	55.5	+59.9	129.8	5	17.0	+60.0	129.9	4	38.5	+60.0	129.9	4
5	9	28.2	+59.8	129.3	8	50.2	+59.8	129.4	8	12.0	+59.9	129.6	7	33.8	+59.9	129.7	6	55.4	+60.0	129.8	6	17.0	+60.0	129.8	5	38.5	+60.0	129.9	5
6	10	28.0	+59.7	129.2	9	50.0	+59.8	129.4	9	11.9	+59.8	129.5	8	33.7	+59.9	129.6	7	55.4	+59.9	129.7	7	17.0	+60.0	129.8	6	38.5	+60.0	129.9	6
7	11	27.7	+59.7	129.1	10	49.8	+59.8	129.3	10	11.7	+59.9	129.4	9	33.6	+59.9	129.6	8	55.3	+60.0	129.7	8	17.0	+60.0	129.8	7	38.5	+60.0	129.9	7
8	12	27.4	+59.8	129.0	11	49.6	+59.8	129.2	11	11.6	+59.9	129.3	10	33.5	+59.9	129.5	9	55.3	+59.9	129.6	9	17.0	+59.9	129.8	8	38.5	+60.0	129.9	8
9	13	27.2	+59.7	128.9	12	49.4	+59.8	129.1	12	11.5	+59.8	129.3	11	33.4	+59.9	129.4	10	55.2	+60.0	129.6	10	16.9	+60.0	129.7	9	38.5	+60.0	129.9	9
10	14	26.9	+59.7	128.8	13	49.2	+59.8	129.0	13	11.3	+59.9	129.2	12	33.3	+59.9	129.4	11	55.2	+59.9	129.6	11	16.9	+60.0	129.7	10	38.5	+60.0	129.9	10
11	15	26.6	+59.7	128.7	14	49.0	+59.8	128.9	14	11.2	+59.8	129.1	13	33.2	+59.9	129.3	12	55.1	+60.0	129.5	12	16.9	+60.0	129.7	11	38.5	+60.0	129.8	11
12	16	26.3	+59.7	128.6	15	48.8	+59.8	128.9	15	11.0	+59.9	129.1	14	33.1	+59.9	129.3	13	55.1	+59.9	129.5	13	16.9	+59.9	129.7	12	38.5	+60.0	129.8	12
13	17	26.0	+59.7	128.5	16	48.6	+59.7	128.8	16	10.9	+59.8	129.0	15	33.0	+60.0	129.2	14	55.0	+60.0	129.4	14	16.8	+60.0	129.6	13	38.5	+60.0	130.0	13
14	18	25.7	+59.7	128.4	17	48.3	+59.8	128.7	17	10.7	+59.9	128.9	16	33.0	+59.9	129.2	15	55.0	+59.9	129.4	15	16.8	+60.0	129.6	14	38.5	+60.0	130.0	14
15	19	25.4	+59.7	128.3	18	48.1	+59.8	128.6	18	10.6	+59.9	128.8	17	32.9	+59.9	129.1	16	54.9	+60.0	129.3	16	16.8	+60.0	129.6	15	38.5	+60.0	129.8	15
16	20	25.1	+59.7	128.2	19	47.9	+59.8	128.5	19	10.5	+59.8	128.8	18	32.8	+59.9	129.0	17	54.9	+59.9	129.3	17	16.8	+59.9	129.5	16	38.5	+60.0	129.8	16
17	21	24.8	+59.7	128.1	20	47.7	+59.8	128.4	20	10.3	+59.8	128.7	19	32.7	+59.9	129.0	18	54.8	+60.0	129.3	18	16.7	+60.0	129.5	17	38.5	+60.0	129.8	17
18	22	24.5	+59.7	128.0	21	47.5	+59.7	128.3	21	10.1	+59.9	128.6	20	32.6	+59.9	128.9	19	54.8	+59.9	129.2	19	16.7	+60.0	129.5	18	38.5	+60.0	130.0	18
19	23	24.2	+59.7	127.9	22	47.2	+59.8	128.2	22	10.0	+59.8	128.5	21	32.5	+59.9	128.9	20	54.7	+60.0	129.2	20	16.7	+60.0	129.5	19	38.5	+60.0	130.0	19
20	24	23.9	+59.7	127.8	23	47.0	+59.8	128.1	23	9.8	+59.9	128.5	22	32.4	+59.9	128.8	21	54.7	+59.9	129.1	21	16.7	+59.9	129.4	20	38.5	+59.9	129.7	20
21	25	23.6	+59.7	127.7	24	46.8	+59.8	128.0	24	9.7	+59.8	128.4	23	32.3	+59.9	128.7	22	54.6	+59.9	129.1	22	16.6	+60.0	129.4	21	38.4	+60.0	129.7	21
22	26	23.3	+59.6	127.5	25	46.6	+59.7	127.9	25	9.5	+59.8	128.3	24	32.2	+59.9	128.7	23	54.5	+60.0	129.0	23	16.6	+60.0	129.4	22	38.4	+60.0	129.7	22
23	27	22.9	+59.7	127.4	26	46.3	+59.8	127.8	26	9.3	+59.9	128.2	25	32.1	+59.9	128.6	24	54.5	+59.9	129.0	24	16.6	+60.0	129.3	23	38.4	+60.0	130.0	23
24	28	22.6	+59.7	127.3	27	46.1	+59.7	127.7	27	9.2	+59.8	128.1	26	32.0	+59.9	128.5	25	54.4	+60.0	128.9	25	16.6	+59.9	129.3	24	38.4	+60.0	130.0	24
25	29	22.3	+59.6	127.2	28	45.8	+59.8	127.6	28	9.0	+59.8	128.1	27	31.9	+59.8	128.5	26	54.4	+59.9	128.9	26	16.5	+60.0	129.3	25	38.4	+60.0	129.6	25
26	30	21.9	+59.7	127.1	29	45.6	+59.7	127.5	29	8.8	+59.9	128.0	28	31.7	+59.9	128.4	27	54.3	+59.9	128.8	27	16.5	+60.0	129.2	26	38.4	+60.0	129.6	26
27	31	21.6	+59.6	126.9	30	45.3	+59.7	127.4	30	8.7	+59.8	127.9	29	31.6	+59.9	128.3	28	54.2	+60.0	128.8	28	16.5	+60.0	129.2	27	38.4	+60.0	130.0	27
28	32	21.2	+59.6	126.8	31	45.0	+59.8	127.3	31	8.5	+59.8	127.8	30	31.5	+59.9	128.3	29	54.2	+59.9	128.7	29	16.5	+59.9	129.2	28	38.4	+60.0	130.0	28
29	33	20.8	+59.6	126.7	32	44.8	+59.7	127.2	32	8.3	+59.8	127.7	31	31.4	+59.9	128.2	30	54.1	+59.9	128.7	30	16.4	+60.0	129.1	29	38.4	+60.0	129.6	29
30	34	20.4	+59.7	126.5	33	44.5	+59.7	127.1	33	8.1	+59.8	127.6	32	31.3	+59.9	128.1	31	54.0	+60.0	128.6	31	16.4	+60.0	129.1	30	38.4	+60.0	129.6	30
31	35	20.1	+59.6	126.4	34	44.2	+59.7	127.0	34	7.9	+59.8	127.5	33	31.2	+59.8	128.0	32	54.0	+59.9	128.6	32	16.4	+59.9	129.0	31	38.4	+60.0	130.0	31
32	36	19.7	+59.5	126.3	35	43.9	+59.7	126.8	35	7.7	+59.8	127.4	34	31.0	+59.9	128.0	33	53.9	+59.9	128.5	33	16.3	+60.0	129.0	32	38.4	+60.0	130.0	32
33	37	19.2	+59.6	126.1	36	43.6	+59.7	126.7	36	7.5	+59.8	127.3	35	30.9	+59.9	127.9	34	53.8	+60.0	128.4	34	16.3	+60.0	129.0	33	38.4	+60.0	130.0	33
34	38	18.8	+59.6	126.0	37	43.3	+59.7	126.4	37	7.3	+59.8	127.2	36	30.8	+59.8	127.8	35	53.8	+59.9	128.4	35	16.3	+60.0	129.0	34	38.4	+60.0	130.0	34
35	39	18.4	+59.6	125.8	38	43.0	+59.7	126.5	38	7.1	+59.8	127.1	37	30.6	+59.9	127.7	36	53.7	+59.9	128.3	36	16.3	+59.9	128.9	35	38.4	+60.0	130.0	35
36	40	18.0	+59.5	125.7	39	42.7	+59.7	126.3	39	6.9	+59.7	127.0	38	30.5	+59.9	127.6	37	53.6	+59.9	128.2	37	16.2	+60.0	128.9	36	38.4	+60.0	130.0	36
37	41	17.5	+59.5	125.5	40	42.4	+59.6	126.2	40	6.6																			

**LATITUDE CONTRARY NAME TO DECLINATION**

**L.H.A. 50°, 310°**

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	4	29.6	-59.8	129.8	3	51.2	-59.9	129.8	3	12.7	-59.9	129.9	2	34.2	-59.9	129.9	1	55.7	-60.0	130.0	1	17.1	-60.0	130.0	0	38.6	-60.0	130.0	0	0.00	+60.0	50.0	0
	1	3	29.8	-59.7	129.9	2	51.3	-59.8	129.9	2	12.8	-59.8	130.0	1	34.3	-59.9	130.0	0	55.7	-59.9	130.0	0	17.1	-59.9	130.0	0	21.4	+60.0	50.0	1			
	2	2	30.1	-59.7	130.0	1	51.5	-59.8	130.0	1	13.0	-59.9	130.0	0	34.4	-59.9	130.0	0	42.4	+60.0	50.0	1	21.4	+60.0	50.0	2							
	3	1	30.4	-59.8	130.1	0	51.7	-59.8	130.1	0	13.1	-59.9	130.1	0	25.5	+60.0	49.9	2	42.8	+60.0	49.9	2	21.4	+60.0	50.0	3							
	4	0	30.6	-59.7	130.2	0	08.1	+59.8	49.8	0	46.8	+59.8	49.8	1	25.5	+59.9	49.9	2	40.1	+60.0	49.9	3	21.4	+60.0	50.0	4							
5	0	29.1	+59.7	49.7	1	07.9	+59.8	49.8	1	46.6	+59.9	49.8	2	25.4	+59.9	49.8	3	04.1	+59.9	49.8	3	42.8	+59.9	49.9	4	21.4	+60.0	49.9	5				
6	1	28.8	+59.8	49.6	2	07.7	+59.8	49.7	2	46.5	+59.9	49.7	3	25.3	+59.9	49.7	4	04.0	+60.0	49.8	5	21.4	+60.0	49.9	6	0.00	+60.0	50.0	6				
7	2	28.6	+59.7	49.6	3	07.5	+59.8	49.6	3	46.4	+59.8	49.6	4	25.2	+59.9	49.7	5	04.0	+59.9	49.8	6	21.4	+60.0	49.9	7	0.00	+60.0	50.0	7				
8	3	28.3	+59.8	49.5	4	07.3	+59.8	49.5	4	46.2	+59.9	49.6	5	25.1	+59.9	49.6	6	03.9	+60.0	49.7	6	21.4	+60.0	49.9	8	0.00	+60.0	50.0	8				
9	4	28.1	+59.7	49.4	5	07.1	+59.8	49.4	5	46.1	+59.8	49.5	6	25.0	+59.9	49.6	7	03.9	+59.9	49.7	7	21.4	+60.0	49.9	9	0.00	+60.0	50.0	9				
10	5	27.8	+59.7	49.3	6	06.9	+59.8	49.4	6	46.0	+59.8	49.4	7	24.9	+60.0	49.5	8	03.8	+60.0	49.6	8	21.4	+59.9	49.7	9	21.4	+60.0	49.9	10				
11	6	27.5	+59.8	49.2	7	06.7	+59.8	49.3	7	45.8	+59.9	49.4	8	24.9	+59.9	49.5	9	03.8	+59.9	49.6	9	21.4	+60.0	49.9	11	0.00	+60.0	50.0	11				
12	7	27.3	+59.7	49.1	8	06.5	+59.8	49.2	8	45.7	+59.9	49.3	9	24.8	+59.9	49.4	10	03.7	+60.0	49.5	10	21.4	+60.0	49.9	12	0.00	+60.0	50.0	12				
13	8	27.0	+59.7	49.0	9	06.3	+59.8	49.1	9	45.6	+59.8	49.2	10	24.7	+59.9	49.4	11	03.7	+59.9	49.5	11	21.4	+60.0	49.8	13	0.00	+60.0	50.0	13				
14	9	26.7	+59.8	48.9	10	06.1	+59.8	49.0	10	45.4	+59.9	49.2	11	24.6	+59.9	49.3	12	03.6	+60.0	49.5	12	21.4	+60.0	49.8	14	0.00	+60.0	50.0	14				
15	10	26.5	+59.7	48.8	11	05.9	+59.8	48.9	11	45.3	+59.8	49.1	12	24.5	+59.9	49.3	13	03.6	+59.9	49.4	13	21.4	+60.0	49.6	14	21.4	+59.9	49.8	15				
16	11	26.2	+59.7	48.7	12	05.7	+59.8	48.9	12	45.1	+59.9	49.0	13	24.4	+59.9	49.2	14	03.5	+60.0	49.4	14	21.4	+60.0	49.6	15	21.4	+60.0	50.0	16				
17	12	25.9	+59.7	48.6	13	05.5	+59.8	48.8	13	45.0	+59.9	49.0	14	24.3	+59.9	49.1	15	03.5	+59.9	49.3	15	21.4	+60.0	49.6	16	21.4	+60.0	50.0	17				
18	13	25.6	+59.8	48.5	14	05.3	+59.8	48.7	14	44.9	+59.8	48.9	15	24.2	+59.9	49.1	16	03.4	+60.0	49.3	16	21.4	+60.0	49.5	18	0.00	+60.0	50.0	18				
19	14	25.4	+59.7	48.4	15	05.1	+59.8	48.6	15	44.7	+59.9	49.0	16	24.1	+59.9	49.0	17	03.4	+59.9	49.3	17	21.4	+59.9	49.5	18	21.4	+60.0	50.0	19				
20	15	25.1	+59.7	48.3	16	04.9	+59.8	48.5	16	44.6	+59.8	48.7	17	24.0	+59.9	49.0	18	03.3	+60.0	49.2	18	21.4	+60.0	49.5	19	21.3	+60.0	49.7	20				
21	16	24.8	+59.7	48.2	17	04.7	+59.8	48.4	17	44.4	+59.9	48.7	18	23.9	+60.0	48.9	19	03.3	+59.9	49.2	19	21.4	+60.0	49.4	20	21.3	+60.0	50.0	21				
22	17	24.5	+59.7	48.1	18	04.5	+59.8	48.3	18	44.3	+59.8	48.6	19	23.9	+59.9	48.9	20	03.2	+60.0	49.1	20	21.4	+60.0	49.4	21	21.3	+60.0	50.0	22				
23	18	24.2	+59.7	48.0	19	04.3	+59.8	48.3	19	44.1	+59.9	48.5	20	23.8	+59.9	48.8	21	03.2	+59.9	49.1	21	21.4	+59.9	49.4	22	21.3	+60.0	50.0	23				
24	19	23.9	+59.7	47.9	20	04.1	+59.7	48.2	20	44.0	+59.8	48.4	21	23.7	+59.9	48.7	22	03.1	+60.0	49.0	22	21.3	+60.0	49.3	23	21.3	+60.0	50.0	24				
25	20	23.6	+59.7	47.8	21	03.8	+59.8	48.1	21	43.8	+59.9	48.4	22	23.6	+59.9	48.7	23	03.1	+59.9	49.0	23	21.3	+60.0	49.3	24	21.3	+60.0	49.6	25				
26	21	23.3	+59.7	47.7	22	03.6	+59.8	48.0	22	43.7	+59.8	48.3	23	23.5	+59.9	48.6	24	03.0	+59.9	48.9	24	21.3	+60.0	49.3	25	21.3	+60.0	50.0	26				
27	22	23.0	+59.7	47.6	23	03.4	+59.8	47.9	23	43.5	+59.8	48.2	24	23.4	+59.8	48.5	25	02.9	+60.0	48.9	25	21.3	+60.0	49.6	26	21.3	+60.0	50.0	27				
28	23	22.7	+59.7	47.5	24	03.2	+59.7	47.8	24	43.3	+59.9	48.1	25	23.2	+59.9	48.5	26	02.9	+59.9	48.8	26	21.2	+60.0	49.2	27	21.3	+60.0	50.0	28				
29	24	22.4	+59.7	47.4	25	02.9	+59.8	47.7	25	43.2	+59.8	48.0	26	23.1	+59.9	48.4	27	02.8	+60.0	48.8	27	21.2	+60.0	49.2	28	21.3	+60.0	50.0	29				
30	25	22.1	+59.7	47.2	26	02.7	+59.7	47.6	26	43.0	+59.8	48.0	27	23.0	+59.9	48.3	28	02.8	+59.9	48.7	28	21.2	+59.9	49.1	29	21.3	+60.0	49.6	30				
31	26	21.8	+59.6	47.1	27	02.4	+59.8	47.5	27	42.8	+59.9	47.9	28	22.9	+59.9	48.3	29	02.7	+59.9	48.7	29	21.2	+60.0	49.5	31	0.00	+60.0	50.0	31				
32	27	21.4	+59.7	47.0	28	02.2	+59.7	47.4	28	42.7	+59.8	47.8	29	22.8	+59.9	48.2	30	02.6	+60.0	48.6	31	21.2	+60.0	49.5	32	0.00	+60.0	50.0	32				
33	28	21.1	+59.7	46.9	29	01.9	+59.8	47.3	29	42.5	+59.8	47.7	30	22.7	+59.9	48.1	31	02.6	+59.9	48.6	31	21.2	+60.0	49.5	33	0.00	+60.0	50.0	33				
34	29	20.8	+59.6	46.8	30	01.7	+59.7	47.2	30	42.3	+59.8	47.6	31	22.6	+59.9	48.1	32	02.5	+59.9	48.5	32	21.2	+60.0	49.5	34	0.00	+60.0	50.0	34				
35	30	20.4	+59.7	46.6	31	01.4	+59.8	47.1	31	42.1	+59.8	47.5	32	22.5	+59.8	48.0	33	02.4	+60.0	48.5	33	21.0	+60.0	49.0	35	0.00	+60.0	50.0	35				
36	31	20.1	+59.6	46.5	32	01.2	+59.7	47.0	32	41.9	+59.8	47.4	33	22.3	+59.9	47.9	34	02.4	+59.9	48.4	34	21.2	+60.0	48.9	36	0.00	+60.0	50.0	36				
37	32	19.7	+59.6	46.4	33	00.9	+59.7	46.9	33	41.7	+59.9	47.3	34	22.2	+59.9	47.8	35	02.3	+59.9	48.3	35	21.2	+60.0	49.5	37	0.00	+60.0	50.0	37				
38	33	19.3	+59.6	46.3	34	00.6	+59.7	46.7	34	41.6	+59.8	47.2	35</td																				

51°, 309° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
Dec.	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Dec.
0	4	23.9	+59.7	128.8	3	46.3	+59.8	128.8	3	08.7	+59.8	128.9	2	31.0	+59.9	128.9	1	53.2	+60.0	129.0	0	37.8	+60.0	129.0	0
1	5	23.6	+59.8	128.7	4	46.1	+59.8	128.8	4	08.5	+59.9	128.8	3	30.9	+59.9	128.9	2	53.2	+59.9	128.9	1	37.8	+59.9	129.0	1
2	6	23.4	+59.7	128.6	5	45.9	+59.8	128.7	5	08.4	+59.8	128.8	4	30.8	+59.9	128.8	3	53.1	+60.0	128.9	2	37.7	+60.0	129.0	2
3	7	23.1	+59.7	128.5	6	45.7	+59.8	128.6	6	08.2	+59.9	128.7	5	30.7	+59.9	128.8	4	53.1	+60.0	128.9	3	37.7	+60.0	129.0	3
4	8	22.8	+59.7	128.4	7	45.5	+59.8	128.5	7	08.1	+59.9	128.6	6	30.6	+59.9	128.7	5	53.0	+60.0	128.8	4	37.7	+60.0	128.9	4
5	9	22.5	+59.8	128.3	8	45.3	+59.8	128.4	8	08.0	+59.9	128.6	7	30.5	+59.9	128.7	6	53.0	+59.9	128.8	5	37.7	+60.0	128.9	5
6	10	22.3	+59.7	128.2	9	45.1	+59.8	128.4	9	07.8	+59.9	128.5	8	30.4	+59.9	128.6	7	52.9	+60.0	128.7	6	37.7	+60.0	128.9	6
7	11	22.0	+59.7	128.1	10	44.9	+59.8	128.3	10	07.7	+59.8	128.4	9	30.3	+59.9	128.5	8	52.9	+59.9	128.8	7	37.7	+60.0	128.9	7
8	12	21.7	+59.7	128.0	11	44.7	+59.8	128.2	11	07.5	+59.9	128.3	10	30.2	+60.0	128.5	9	52.8	+60.0	128.6	8	37.7	+60.0	128.9	8
9	13	21.4	+59.7	127.9	12	44.5	+59.8	128.1	12	07.4	+59.8	128.3	11	30.2	+59.9	128.4	10	52.8	+60.0	128.7	9	37.7	+60.0	128.9	9
10	14	21.1	+59.7	127.8	13	44.3	+59.8	128.0	13	07.2	+59.9	128.2	12	30.1	+59.9	128.4	11	52.7	+60.0	128.5	10	37.7	+60.0	128.9	10
11	15	20.8	+59.8	127.7	14	44.1	+59.7	127.9	14	07.1	+59.8	128.1	13	30.0	+59.9	128.3	12	52.7	+59.9	128.5	11	37.7	+60.0	128.8	11
12	16	20.6	+59.7	127.6	15	43.8	+59.8	127.8	15	06.9	+59.9	128.1	14	29.9	+59.9	128.3	13	52.6	+60.0	128.5	12	37.7	+60.0	128.8	12
13	17	20.3	+59.7	127.5	16	43.6	+59.8	127.8	16	06.8	+59.8	128.0	15	29.8	+59.9	128.2	14	52.6	+60.0	128.6	13	37.7	+60.0	128.8	13
14	18	20.0	+59.7	127.4	17	43.4	+59.8	127.7	17	06.6	+59.9	127.9	16	29.7	+59.9	128.1	15	52.5	+60.0	128.4	14	37.7	+60.0	128.8	14
15	19	19.7	+59.7	127.3	18	43.2	+59.8	127.6	18	06.5	+59.8	127.8	17	29.6	+59.9	128.1	16	52.5	+59.9	128.6	15	37.7	+60.0	128.8	15
16	20	19.4	+59.7	127.2	19	43.0	+59.7	127.5	19	06.3	+59.9	127.8	18	29.5	+59.9	128.0	17	52.4	+60.0	128.3	16	37.7	+60.0	128.8	16
17	21	19.1	+59.6	127.1	20	42.7	+59.8	127.4	20	06.2	+59.8	127.7	19	29.4	+59.9	128.0	18	52.4	+59.9	128.2	17	37.7	+60.0	128.8	17
18	22	18.7	+59.7	127.0	21	42.5	+59.8	127.3	21	06.0	+59.9	127.6	20	29.3	+59.9	127.9	19	52.3	+60.0	128.5	18	37.7	+59.9	128.7	18
19	23	18.4	+59.7	126.9	22	42.3	+59.8	127.2	22	05.9	+59.8	127.5	21	29.2	+59.9	127.8	20	52.3	+59.9	128.1	19	37.6	+60.0	128.7	19
20	24	18.1	+59.7	126.7	23	42.1	+59.7	127.1	23	05.7	+59.8	127.4	22	29.1	+59.9	127.8	21	52.2	+59.9	128.1	20	37.6	+60.0	128.7	20
21	25	17.8	+59.6	126.6	24	41.8	+59.8	127.0	24	05.5	+59.9	127.4	23	29.0	+59.9	127.7	22	52.1	+60.0	128.1	21	37.6	+60.0	128.7	21
22	26	17.4	+59.7	126.5	25	41.6	+59.7	126.9	25	05.4	+59.8	127.3	24	28.9	+59.9	127.7	23	52.1	+59.9	128.0	22	37.6	+60.0	128.7	22
23	27	17.1	+59.7	126.4	26	41.3	+59.8	126.8	26	05.2	+59.8	127.2	25	28.8	+59.9	127.6	24	52.0	+60.0	128.0	23	37.6	+60.0	128.7	23
24	28	16.8	+59.6	126.3	27	41.1	+59.7	126.7	27	05.0	+59.9	127.1	26	28.7	+59.9	127.5	25	52.0	+60.0	127.9	24	37.6	+60.0	128.6	24
25	29	16.4	+59.6	126.2	28	40.8	+59.8	126.6	28	04.9	+59.8	127.0	27	28.6	+59.8	127.5	26	51.9	+59.9	127.9	25	37.6	+60.0	128.6	25
26	30	16.0	+59.7	126.0	29	40.6	+59.7	126.5	29	04.7	+59.8	126.9	28	28.4	+59.9	127.4	27	51.8	+60.0	127.8	26	37.6	+60.0	128.6	26
27	31	15.7	+59.6	125.9	30	40.3	+59.7	126.4	30	04.5	+59.8	126.9	29	28.3	+59.9	127.3	28	51.8	+59.9	127.8	27	37.6	+60.0	128.6	27
28	32	15.3	+59.6	125.8	31	40.0	+59.7	126.3	31	04.3	+59.8	126.8	30	28.2	+59.9	127.2	29	51.7	+59.9	127.7	28	37.6	+60.0	129.0	28
29	33	14.9	+59.6	125.6	32	39.7	+59.8	126.2	32	04.1	+59.8	126.7	31	28.1	+59.9	127.2	30	51.6	+60.0	127.6	29	37.6	+60.0	128.6	29
30	34	14.5	+59.6	125.5	33	39.5	+59.7	126.0	33	03.9	+59.8	126.6	32	28.0	+59.8	127.1	31	51.6	+59.9	127.6	30	37.6	+60.0	128.5	30
31	35	14.1	+59.6	125.4	34	39.2	+59.7	125.9	34	03.7	+59.8	126.5	33	27.8	+59.9	127.0	32	51.5	+59.9	127.5	31	37.6	+60.0	129.0	31
32	36	13.7	+59.6	125.2	35	38.9	+59.7	125.8	35	03.5	+59.8	126.4	34	27.7	+59.9	126.9	33	51.4	+60.0	127.5	32	37.6	+60.0	128.5	32
33	37	13.3	+59.6	125.1	36	38.6	+59.7	125.7	36	03.3	+59.8	126.3	35	27.6	+59.8	126.9	34	51.4	+59.9	127.4	33	37.6	+59.9	128.5	33
34	38	12.9	+59.5	124.9	37	38.3	+59.6	125.6	37	03.1	+59.8	126.2	36	27.4	+59.9	126.8	35	51.3	+59.9	127.4	34	37.6	+60.0	129.0	34
35	39	12.4	+59.6	124.8	38	37.9	+59.7	125.4	38	02.9	+59.8	126.1	37	27.3	+59.9	126.7	36	51.2	+59.9	127.3	35	37.5	+60.0	128.4	35
36	40	12.0	+59.5	124.6	39	37.6	+59.7	125.3	39	02.7	+59.7	126.0	38	27.2	+59.8	126.6	37	51.1	+59.9	127.2	36	37.5	+60.0	128.4	36
37	41	11.5	+59.5	124.4	40	37.3	+59.6	125.1	40	02.4	+59.8	125.8	39	27.0	+59.9	126.5	38	51.0	+60.0	127.2	37	37.5	+60.0	129.0	37
38	42	11.0	+59.5	124.3	41	36.9	+59.7	125.0	41	02.2	+59.7	125.7	40	26.9	+59.8	126.4	39	51.0	+59.9	127.1	38	37.5	+60.0	129.0	39
39	43	10.5	+59.5	124.1	42	36.6	+59.6	124.9	42	01.9	+59.8	125.6	41	26.7	+59.7	126.3	40	50.9	+59.9	127.0	39	37.5	+60.0	129.0	39
40	44	10.0	+59.5	123.9	43	36.2	+59.6	124.7	43	01.7	+59.7	125.5	42	26.6	+59.8	126.2	41	50.8	+59.9	126.9	40	37.5	+60.0	128.3	40
41	45	09.5	+59.4	123.7	44	35.8	+59.6	124.5	44	01.4	+59.8	125.3	43	26.4	+59.8	126.1	42	50.7	+59.9	126.9	41	37.5	+60.0	129.0	41
42	46	08.9	+59.4	123.5	45	35.4	+59.6	124.4	45	01.2	+59.7	125.2	44	26.2	+59.8	126.0	43	50.6	+59.9	126.8	42	37.5	+60.0		

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $51^\circ$ ,  $309^\circ$

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.				
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z					
0	4	23.9	-59.7	128.8	3	46.3	-59.8	128.8	3	08.7	-59.9	128.9	2	31.0	-59.9	128.9	1	53.2	-59.9	129.0	0	37.8	-60.0	129.0	0	00.0	+60.0	51.0	0
	1	34.2	-59.7	128.9	2	46.5	-59.8	128.9	2	08.8	-59.9	129.0	1	31.1	-60.0	129.0	0	53.3	-60.0	129.0	0	22.2	+60.0	51.0	1				
	2	24.5	-59.8	129.0	1	46.7	-59.8	129.0	1	08.9	-59.8	129.0	0	31.1	-59.9	129.0	0	06.7	+59.9	51.0	1	00.0	+60.0	51.0	2				
	3	14.7	-59.7	129.1	0	46.9	-59.8	129.1	0	09.1	-59.9	129.1	0	28.8	+59.9	50.9	1	06.6	+60.0	50.9	1	22.2	+60.0	51.0	3				
	4	02.0	-59.7	129.2	0	12.9	+59.8	50.8	0	50.8	+59.9	50.8	1	28.7	+59.9	50.9	2	06.6	+59.9	50.9	2	22.2	+60.0	51.0	4				
5	0	34.7	+59.8	50.7	1	12.7	+59.8	50.7	1	50.7	+59.8	50.8	2	28.6	+59.9	50.8	3	06.5	+60.0	50.8	4	22.2	+60.0	50.9	5	00.0	+60.0	51.0	5
6	1	34.5	+59.7	50.6	2	12.5	+59.8	50.7	2	50.5	+59.9	50.7	3	28.5	+59.9	50.7	4	06.5	+59.9	50.8	5	22.2	+60.0	50.9	6	00.0	+60.0	51.0	6
7	2	34.2	+59.7	50.5	3	12.3	+59.8	50.6	3	50.4	+59.8	50.6	4	28.4	+59.9	50.7	5	06.4	+60.0	50.8	6	22.2	+60.0	50.9	7	00.0	+60.0	51.0	7
8	3	33.9	+59.8	50.5	4	12.1	+59.8	50.5	4	50.2	+59.9	50.6	5	28.3	+59.9	50.6	6	06.4	+59.9	50.7	7	22.2	+60.0	50.9	8	00.0	+60.0	51.0	8
9	4	33.7	+59.7	50.4	5	11.9	+59.8	50.4	5	50.1	+59.9	50.5	6	28.2	+60.0	50.6	7	06.3	+60.0	50.7	8	22.2	+60.0	50.9	9	00.0	+60.0	51.0	9
10	5	33.4	+59.7	50.3	6	11.7	+59.8	50.3	6	50.0	+59.8	50.4	7	28.2	+59.9	50.5	8	06.3	+59.9	50.6	9	22.2	+60.0	50.9	10	00.0	+60.0	51.0	10
11	6	33.1	+59.7	50.2	7	11.5	+59.8	50.3	7	49.8	+59.9	50.4	8	28.1	+59.9	50.5	9	06.2	+60.0	50.6	10	22.2	+60.0	50.9	11	00.0	+60.0	51.0	11
12	7	32.8	+59.8	50.1	8	11.3	+59.8	50.2	8	49.7	+59.8	50.3	9	28.0	+59.9	50.4	10	06.2	+59.9	50.5	11	22.2	+60.0	50.8	12	00.0	+60.0	51.0	12
13	8	32.6	+59.7	50.0	9	11.1	+59.8	50.1	9	49.5	+59.9	50.2	10	27.9	+59.9	50.4	11	06.1	+59.9	50.5	12	22.2	+60.0	50.8	13	00.0	+60.0	51.0	13
14	9	32.3	+59.7	49.9	10	10.9	+59.8	50.0	10	49.4	+59.9	50.1	11	27.8	+59.9	50.3	12	06.0	+60.0	50.5	13	22.2	+60.0	50.8	14	00.0	+60.0	51.0	14
15	10	32.0	+59.7	49.8	11	10.7	+59.8	49.9	11	49.3	+59.8	50.1	12	27.7	+59.9	50.2	13	06.0	+59.9	50.4	14	22.2	+60.0	50.8	15	00.0	+60.0	51.0	15
16	11	31.7	+59.7	49.7	12	10.5	+59.8	49.8	12	49.1	+59.9	50.0	13	27.6	+59.9	50.2	14	05.9	+60.0	50.4	15	22.2	+60.0	50.8	16	00.0	+60.0	51.0	16
17	12	31.4	+59.8	49.6	13	10.3	+59.8	49.8	13	49.0	+59.8	49.9	14	27.5	+59.9	50.1	15	05.9	+59.9	50.3	16	22.1	+60.0	50.8	17	00.0	+60.0	51.0	17
18	13	31.2	+59.7	49.5	14	10.1	+59.8	49.7	14	48.8	+59.9	49.9	15	27.4	+59.9	50.1	16	05.8	+60.0	50.3	17	22.1	+60.0	50.8	18	00.0	+60.0	51.0	18
19	14	30.9	+59.7	49.4	15	09.9	+59.7	49.6	15	48.7	+59.8	49.8	16	27.3	+59.9	50.0	17	05.8	+59.9	50.2	18	22.1	+60.0	50.7	19	00.0	+60.0	51.0	19
20	15	30.6	+59.7	49.3	16	09.6	+59.8	49.5	16	48.5	+59.9	49.7	17	27.2	+59.9	50.0	18	05.7	+60.0	50.2	19	22.1	+60.0	50.7	20	00.0	+60.0	51.0	20
21	21	30.3	+59.7	49.2	17	09.4	+59.8	49.4	17	48.4	+59.8	49.6	18	27.1	+59.9	49.9	19	05.7	+59.9	50.2	20	22.1	+60.0	50.7	21	00.0	+60.0	51.0	21
22	22	30.0	+59.7	49.1	18	09.2	+59.8	49.3	18	48.2	+59.9	49.6	19	27.0	+59.9	49.8	20	05.6	+60.0	50.1	21	22.1	+60.0	50.7	22	00.0	+60.0	51.0	22
23	23	29.7	+59.7	49.0	19	09.0	+59.8	49.2	19	48.1	+59.8	49.5	20	26.9	+59.9	49.8	21	05.6	+59.9	50.1	22	22.1	+60.0	50.7	23	00.0	+60.0	51.0	23
24	24	29.4	+59.7	48.9	20	08.8	+59.7	49.1	20	47.9	+59.8	49.4	21	26.8	+59.9	49.7	22	05.5	+59.9	50.0	23	22.1	+60.0	50.7	24	00.0	+60.0	51.0	24
25	25	29.1	+59.7	48.8	21	08.5	+59.8	49.0	21	47.7	+59.9	49.3	22	26.7	+59.9	49.6	23	05.4	+60.0	50.0	24	22.1	+60.0	50.6	25	00.0	+60.0	51.0	25
26	26	28.8	+59.7	48.6	22	08.3	+59.8	48.9	22	47.6	+59.8	49.3	23	26.6	+59.9	49.6	24	05.4	+59.9	49.9	25	22.1	+60.0	50.6	26	00.0	+60.0	51.0	26
27	27	28.5	+59.6	48.5	23	08.1	+59.7	48.9	23	47.4	+59.9	49.2	24	26.5	+59.9	49.5	25	05.3	+60.0	49.9	26	22.1	+60.0	50.6	27	00.0	+60.0	51.0	27
28	28	28.1	+59.7	48.4	24	07.8	+59.8	48.8	24	47.3	+59.8	49.1	25	26.4	+59.9	49.5	26	05.3	+59.9	49.8	27	22.1	+60.0	50.6	28	00.0	+60.0	51.0	28
29	29	27.8	+59.7	48.3	25	07.6	+59.8	48.7	25	47.1	+59.8	49.0	26	26.3	+59.9	49.4	27	05.2	+59.9	49.8	28	22.1	+60.0	50.6	29	00.0	+60.0	51.0	29
30	30	27.5	+59.7	48.2	26	07.4	+59.7	48.6	26	46.9	+59.8	48.9	27	26.2	+59.9	49.3	28	05.1	+60.0	49.7	29	22.1	+60.0	50.6	30	00.0	+60.0	51.0	30
31	31	27.2	+59.6	48.1	27	07.1	+59.8	48.5	27	46.7	+59.9	48.8	28	26.1	+59.9	49.2	29	05.1	+59.9	49.7	30	22.1	+60.0	50.5	31	00.0	+60.0	51.0	31
32	32	26.8	+59.7	48.0	28	06.9	+59.7	48.4	28	46.6	+59.8	48.8	29	26.0	+59.8	49.2	30	05.0	+59.9	49.6	31	22.0	+60.0	50.5	32	00.0	+60.0	51.0	32
33	33	26.5	+59.6	47.8	29	06.6	+59.7	48.2	29	46.4	+59.8	48.7	30	25.8	+59.9	49.1	31	04.9	+60.0	49.6	32	22.0	+60.0	50.5	33	00.0	+60.0	51.0	33
34	34	26.1	+59.7	47.7	30	06.3	+59.8	48.1	30	46.2	+59.8	48.6	31	25.7	+59.9	49.0	32	04.9	+59.9	49.5	33	22.0	+60.0	50.5	34	00.0	+60.0	51.0	34
40	40	23.8	+59.6	46.9	41	04.6	+59.6	46.8	41	43.8	+59.8	48.1	42	24.2	+59.8	48.1	43	04.0	+59.9	48.8	44	23.3	+60.0	50.5	45	00.0	+60.0	51.0	45
41	41	23.4	+59.6	46.8	42	04.3	+59.7	46.5	42	43.6	+59.7	47.3	43	24.0	+59.9	48.0	44	03.9	+59.9	48.7	45	22.1	+60.0	50.2	46	00.0	+60.0	51.0	46
42	42	20.7	+59.5	45.8	43	02.3	+59.6	46.5	43	43.3	+59.8	47.9	44	23.9	+59.8	47.9	45	03.8	+59.9	48.6	46	22.1	+60.0	50.4	47	00.0	+60.0	51.0	47
43	43	22.6	+59.5	46.5	44	03.7	+59.6	47.1	44	44.3	+59.8	47.7	45	24.5	+59.8	48.3	46	04.3	+59.9	49.6	47	22.0	+60.0</						

52°, 308° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.				
Dec.	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	Dec.				
0	4	18.2	+59.7	127.8	3	41.4	+59.8	127.8	3	04.6	+59.8	127.9	2	27.7	+59.9	127.9	1	50.8	+59.9	128.0	0	36.9	+60.0	128.0	0	00.0	+60.0	128.0	0
1	5	17.9	+59.7	127.7	4	41.2	+59.8	127.8	4	04.4	+59.9	127.8	3	27.6	+59.9	127.9	2	50.7	+60.0	127.9	2	13.8	+60.0	128.0	1	36.9	+60.0	128.0	1
2	6	17.6	+59.7	127.6	5	41.0	+59.8	127.7	5	04.3	+59.9	127.8	4	27.5	+59.9	127.8	3	50.7	+59.9	127.9	3	13.8	+60.0	127.9	2	36.9	+60.0	128.0	2
3	7	17.3	+59.7	127.5	6	40.8	+59.8	127.6	6	04.1	+59.9	127.7	5	27.4	+59.9	127.8	4	50.6	+60.0	127.8	4	13.8	+60.0	127.9	3	36.9	+60.0	128.0	3
4	8	17.1	+59.7	127.4	7	40.6	+59.8	127.5	7	04.0	+59.9	127.6	6	27.3	+59.9	127.7	5	50.6	+59.9	127.8	5	13.8	+60.0	127.9	4	36.9	+60.0	128.0	4
5	9	16.8	+59.7	127.3	8	40.4	+59.7	127.4	8	03.8	+59.9	127.5	7	27.2	+59.9	127.7	6	50.5	+60.0	127.8	6	13.8	+59.9	127.8	5	36.9	+60.0	128.0	5
6	10	16.5	+59.7	127.2	9	40.1	+59.8	127.3	9	03.7	+59.8	127.5	8	27.1	+59.9	127.6	7	50.5	+59.9	127.7	7	13.7	+60.0	127.8	6	36.9	+60.0	128.0	6
7	11	16.2	+59.7	127.1	10	39.9	+59.8	127.3	10	03.5	+59.9	127.4	9	27.0	+59.9	127.5	8	50.4	+60.0	127.7	8	13.7	+60.0	127.8	7	36.9	+60.0	128.0	7
8	12	15.9	+59.7	127.0	11	39.7	+59.8	127.2	11	03.4	+59.9	127.3	10	26.9	+60.0	127.5	9	50.4	+59.9	127.6	9	13.7	+60.0	127.8	8	36.9	+60.0	128.0	8
9	13	15.6	+59.7	126.9	12	39.5	+59.8	127.1	12	03.3	+59.9	127.3	11	26.9	+59.9	127.4	10	50.3	+60.0	127.6	10	13.7	+59.9	127.7	9	36.9	+60.0	128.0	9
10	14	15.3	+59.7	126.8	13	39.3	+59.8	127.0	13	03.1	+59.9	127.2	12	26.8	+59.9	127.4	11	50.3	+59.9	127.5	11	13.6	+60.0	127.7	10	36.9	+60.0	127.9	10
11	15	15.0	+59.7	126.7	14	39.1	+59.8	126.9	14	03.0	+59.8	127.1	13	26.7	+59.9	127.3	12	50.2	+60.0	127.5	12	13.6	+60.0	127.8	11	36.9	+60.0	128.0	11
12	16	14.7	+59.7	126.6	15	38.9	+59.7	126.8	15	02.8	+59.8	127.0	14	26.6	+59.9	127.3	13	50.2	+59.9	127.5	13	13.6	+60.0	127.8	12	36.9	+60.0	128.0	12
13	17	14.4	+59.7	126.5	16	38.6	+59.8	126.7	16	02.6	+59.9	127.0	15	26.5	+59.9	127.2	14	50.1	+60.0	127.4	14	13.6	+59.9	127.6	13	36.9	+60.0	128.0	13
14	18	14.1	+59.7	126.4	17	38.4	+59.8	126.6	17	02.5	+59.8	126.9	16	26.4	+59.9	127.1	15	50.1	+59.9	127.4	15	13.5	+60.0	127.6	14	36.9	+60.0	128.0	14
15	19	13.8	+59.7	126.3	18	38.2	+59.8	126.6	18	02.3	+59.9	126.8	17	26.3	+59.9	127.1	16	50.0	+59.9	127.3	16	13.5	+60.0	127.6	15	36.9	+59.9	127.8	15
16	20	13.5	+59.7	126.2	19	38.0	+59.7	126.5	19	02.2	+59.8	126.7	18	26.2	+59.9	127.0	17	49.9	+60.0	127.3	17	13.5	+60.0	127.5	16	36.8	+60.0	128.0	16
17	21	13.2	+59.7	126.1	20	37.7	+59.8	126.4	20	02.0	+59.9	126.7	19	26.1	+59.9	127.0	18	49.9	+59.9	127.2	18	13.5	+59.9	127.5	17	36.8	+60.0	128.0	17
18	22	12.9	+59.6	126.0	21	37.5	+59.8	126.3	21	01.9	+59.8	126.6	20	26.0	+59.9	126.9	19	49.8	+60.0	127.2	19	13.4	+60.0	127.5	18	36.8	+60.0	128.0	18
19	23	12.5	+59.7	125.8	22	37.3	+59.7	126.2	22	01.7	+59.8	126.5	21	25.9	+59.9	126.8	20	49.8	+59.9	127.1	20	13.4	+60.0	127.4	19	36.8	+60.0	128.0	19
20	24	12.2	+59.7	125.7	23	37.0	+59.8	126.1	23	01.5	+59.9	126.4	22	25.8	+59.9	126.8	21	49.7	+59.9	127.1	21	13.4	+60.0	127.4	20	36.8	+60.0	128.0	20
21	25	11.9	+59.6	125.6	24	36.8	+59.7	126.0	24	01.4	+59.8	126.3	23	25.7	+59.8	126.7	22	49.6	+60.0	127.0	22	13.4	+59.9	127.4	21	36.8	+60.0	128.0	21
22	26	11.5	+59.7	125.5	25	36.5	+59.8	125.9	25	01.2	+59.8	126.3	24	25.5	+59.9	126.6	23	49.6	+59.9	127.0	23	13.3	+60.0	127.3	22	36.8	+60.0	128.0	22
23	27	11.2	+59.6	125.4	26	36.3	+59.7	125.8	26	01.0	+59.8	126.2	25	25.4	+59.9	126.6	24	49.5	+60.0	126.9	24	13.3	+60.0	127.3	23	36.8	+60.0	128.0	23
24	28	10.8	+59.7	125.2	27	36.0	+59.7	125.7	27	00.8	+59.9	126.1	26	25.3	+59.9	126.5	25	49.5	+59.9	126.9	25	13.3	+60.0	127.3	24	36.8	+60.0	128.0	24
25	29	10.5	+59.6	125.1	28	35.7	+59.8	125.6	28	00.7	+59.8	126.0	27	25.2	+59.9	126.4	26	49.4	+59.9	126.8	26	13.3	+59.9	127.2	25	36.8	+60.0	128.0	25
26	30	10.1	+59.6	125.0	29	35.5	+59.7	125.5	29	00.5	+59.8	125.9	28	25.1	+59.9	126.4	27	49.3	+60.0	126.8	27	13.2	+60.0	127.2	26	36.8	+60.0	128.0	26
27	31	09.7	+59.6	124.9	30	35.2	+59.7	125.4	30	00.3	+59.8	125.8	29	25.0	+59.9	126.3	28	49.3	+59.9	126.7	28	13.2	+60.0	127.6	27	36.8	+60.0	128.0	27
28	32	09.3	+59.6	124.7	31	34.9	+59.7	125.2	31	00.1	+59.8	125.7	30	24.9	+59.8	126.2	29	49.2	+59.9	126.7	29	13.2	+59.9	127.6	28	36.8	+60.0	128.0	28
29	33	08.9	+59.6	124.6	32	34.6	+59.8	125.1	31	01.9	+59.8	125.6	31	24.7	+59.9	126.1	30	49.1	+60.0	126.6	30	13.1	+60.0	127.1	29	36.8	+59.9	127.6	29
30	34	08.5	+59.6	124.5	33	34.4	+59.7	125.0	32	59.7	+59.8	125.5	32	24.6	+59.9	126.1	31	49.1	+59.9	126.6	31	13.1	+60.0	127.1	30	36.7	+60.0	128.0	30
31	35	08.1	+59.6	124.3	34	34.1	+59.7	124.9	33	59.5	+59.8	125.4	33	24.5	+59.8	126.0	32	49.0	+59.9	126.5	32	13.1	+59.9	127.0	31	36.7	+60.0	128.0	31
32	36	07.7	+59.6	124.2	35	33.8	+59.6	124.8	34	59.3	+59.8	125.3	34	24.3	+59.9	125.9	33	48.9	+59.9	126.5	33	13.0	+60.0	127.3	32	36.7	+60.0	128.0	32
33	37	07.3	+59.5	124.0	36	33.4	+59.7	124.6	35	59.1	+59.8	125.2	35	24.2	+59.9	125.8	34	48.8	+60.0	126.4	34	13.0	+60.0	127.5	33	36.7	+60.0	128.0	33
34	38	06.8	+59.6	123.9	37	33.1	+59.7	124.5	36	58.6	+59.7	123.7	36	24.1	+59.8	125.7	35	48.8	+59.9	126.3	35	12.9	+60.0	127.2	34	36.7	+60.0	128.0	34
35	39	06.4	+59.5	123.7	38	32.8	+59.7	124.4	37	58.6	+59.8	125.0	37	23.9	+59.9	125.7	36	48.7	+59.9	126.3	36	12.9	+60.0	127.4	35	36.7	+60.0	128.0	35
36	40	05.9	+59.5	123.5	39	32.5	+59.6	124.2	38	58.4	+59.8	124.9	38	23.8	+59.8	125.6	37	48.6	+59.9	126.2	37	12.9	+60.0	127.4	36	36.7	+60.0	128.0	36
37	41	05.4	+59.5	123.4	40	32.1	+59.6	124.1																					

**LATITUDE CONTRARY NAME TO DECLINATION**

**L.H.A. 52°, 308°**

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	4	18.2	-59.7	127.8	3	41.4	-59.8	127.8	3	04.6	-59.9	127.9	2	27.7	-59.9	127.9	1	50.8	-60.0	128.0	0	36.9	-60.0	128.0	0	00.0	+60.0	52.0	<b>0</b>				
1	3	18.5	-59.8	127.9	2	41.6	-59.8	127.9	2	04.7	-59.9	128.0	1	27.8	-59.9	128.0	0	50.8	-59.9	128.0	0	23.1	+60.0	52.0	1	00.0	+60.0	52.0	<b>1</b>				
2	2	18.7	-59.7	128.0	1	41.8	-59.8	128.0	1	04.8	-59.8	128.0	0	27.9	-59.9	128.0	0	09.1	+60.0	52.0	1	20.1	+59.9	52.0	2	00.0	+60.0	52.0	<b>2</b>				
3	1	19.0	-59.7	128.1	0	42.0	-59.8	128.1	0	05.0	-59.9	128.1	0	32.0	+60.0	51.9	2	10.1	+59.9	51.9	2	23.0	+60.0	52.0	3	00.0	+60.0	52.0	<b>3</b>				
4	0	19.3	-59.7	128.2	0	17.8	+59.8	51.8	0	54.9	+59.8	51.8	1	32.0	+59.9	51.8	2	09.0	+60.0	51.9	3	23.0	+60.0	51.9	4	00.0	+60.0	52.0	<b>4</b>				
5	0	40.4	+59.8	51.7	1	17.6	+59.8	51.7	1	54.7	+59.9	51.8	2	31.9	+59.9	51.8	3	09.0	+59.9	51.8	3	46.0	+60.0	51.9	4	23.0	+60.0	51.9	<b>5</b>	00.0	+60.0	52.0	<b>5</b>
6	1	40.2	+59.7	51.6	2	17.4	+59.8	51.7	2	54.6	+59.9	51.7	3	31.8	+59.9	51.7	4	08.9	+60.0	51.8	4	46.0	+60.0	51.9	5	23.0	+60.0	52.0	<b>6</b>	00.0	+60.0	52.0	<b>6</b>
7	2	39.9	+59.7	51.5	3	17.2	+59.8	51.6	3	54.5	+59.8	51.6	4	31.7	+59.9	51.7	5	08.9	+59.9	51.7	5	46.0	+59.9	51.8	6	23.0	+60.0	51.9	<b>7</b>	00.0	+60.0	52.0	<b>7</b>
8	3	39.6	+59.7	51.4	4	17.0	+59.8	51.5	4	54.3	+59.9	51.6	5	31.6	+59.9	51.6	6	08.8	+60.0	51.7	6	45.9	+60.0	51.8	7	23.0	+60.0	51.9	<b>8</b>	00.0	+60.0	52.0	<b>8</b>
9	4	39.3	+59.7	51.3	5	16.8	+59.8	51.4	5	54.2	+59.8	51.5	6	31.5	+59.9	51.6	7	08.8	+59.9	51.7	7	45.9	+60.0	51.8	8	23.0	+60.0	51.9	<b>9</b>	00.0	+60.0	52.0	<b>9</b>
10	5	39.0	+59.8	51.2	6	16.6	+59.8	51.3	6	54.0	+59.9	51.4	7	31.4	+59.9	51.5	8	08.7	+59.9	51.6	8	45.9	+60.0	51.7	9	23.0	+60.0	51.9	<b>10</b>	00.0	+60.0	52.0	<b>10</b>
11	6	38.8	+59.7	51.1	7	16.4	+59.8	51.2	7	53.9	+59.8	51.3	8	31.3	+59.9	51.5	9	08.6	+60.0	51.6	9	45.9	+60.0	51.7	10	23.0	+60.0	51.9	<b>11</b>	00.0	+60.0	52.0	<b>11</b>
12	7	38.5	+59.7	51.1	8	16.2	+59.7	51.2	8	53.7	+59.9	51.3	9	31.2	+59.9	51.4	10	08.6	+59.9	51.5	10	45.9	+59.9	51.7	11	23.0	+60.0	51.8	<b>12</b>	00.0	+60.0	52.0	<b>12</b>
13	8	38.2	+59.7	51.0	9	15.9	+59.8	51.1	9	53.6	+59.8	51.2	10	31.1	+59.9	51.3	11	08.5	+60.0	51.5	11	45.8	+60.0	51.7	12	23.0	+60.0	51.8	<b>13</b>	00.0	+60.0	52.0	<b>13</b>
14	9	37.9	+59.7	50.9	10	15.7	+59.8	51.0	10	53.4	+59.9	51.1	11	31.0	+59.9	51.3	12	08.5	+59.9	51.5	12	45.8	+60.0	51.6	13	23.0	+60.0	51.8	<b>14</b>	00.0	+60.0	52.0	<b>14</b>
15	10	37.6	+59.7	50.8	11	15.5	+59.8	50.9	11	53.3	+59.8	51.1	12	30.9	+59.9	51.2	13	08.4	+60.0	51.4	13	45.8	+60.0	51.6	14	23.0	+60.0	51.8	<b>15</b>	00.0	+60.0	52.0	<b>15</b>
16	11	37.3	+59.7	50.7	12	15.3	+59.8	50.8	12	53.1	+59.9	51.0	13	30.8	+59.9	51.2	14	08.4	+59.9	51.4	14	45.8	+59.9	51.6	15	23.0	+60.0	51.8	<b>16</b>	00.0	+60.0	52.0	<b>16</b>
17	12	37.0	+59.8	50.6	13	15.1	+59.8	50.7	13	53.0	+59.8	50.9	14	30.7	+59.9	51.1	15	08.3	+60.0	51.3	15	45.7	+60.0	51.5	16	23.0	+60.0	51.8	<b>17</b>	00.0	+60.0	52.0	<b>17</b>
18	13	36.8	+59.7	50.5	14	14.9	+59.8	50.6	14	52.8	+59.9	50.8	15	30.6	+59.9	51.1	16	08.3	+59.9	51.3	16	45.7	+60.0	51.5	17	23.0	+59.9	51.7	<b>18</b>	00.0	+60.0	52.0	<b>18</b>
19	14	36.5	+59.7	50.4	15	14.7	+59.7	50.6	15	52.7	+59.8	50.8	16	30.5	+59.9	51.0	17	08.2	+60.0	51.2	17	45.7	+60.0	51.5	18	22.9	+60.0	51.7	<b>19</b>	00.0	+60.0	52.0	<b>19</b>
20	15	36.2	+59.7	50.2	16	14.4	+59.8	50.5	16	52.5	+59.9	50.7	17	30.4	+59.9	50.9	18	08.2	+59.9	51.2	18	45.7	+59.9	51.4	19	22.9	+60.0	51.7	<b>20</b>	00.0	+60.0	52.0	<b>20</b>
21	16	35.9	+59.7	50.1	17	14.2	+59.8	50.4	17	52.4	+59.8	50.6	18	30.3	+59.9	50.9	19	08.1	+59.9	51.1	19	45.6	+60.0	51.4	20	22.9	+60.0	51.7	<b>21</b>	00.0	+60.0	52.0	<b>21</b>
22	17	35.6	+59.7	50.0	18	14.0	+59.8	50.3	18	52.2	+59.9	50.5	19	30.2	+59.9	50.8	20	08.0	+60.0	51.1	20	45.6	+60.0	51.4	21	22.9	+60.0	51.7	<b>22</b>	00.0	+60.0	52.0	<b>22</b>
23	18	35.3	+59.6	49.9	19	13.8	+59.7	50.2	19	52.1	+59.8	50.5	20	30.1	+59.9	50.8	21	08.0	+59.9	51.0	21	45.6	+60.0	51.4	22	22.9	+60.0	51.7	<b>23</b>	00.0	+60.0	52.0	<b>23</b>
24	19	34.9	+59.7	49.8	20	13.5	+59.8	50.1	20	51.9	+59.8	50.4	21	30.0	+59.9	50.7	22	07.9	+60.0	51.0	22	45.6	+59.9	51.3	23	22.9	+60.0	51.7	<b>24</b>	00.0	+60.0	52.0	<b>24</b>
25	20	34.6	+59.7	49.7	21	13.3	+59.8	50.0	21	51.7	+59.9	50.3	22	29.9	+59.9	50.6	23	07.9	+59.9	51.0	23	45.5	+60.0	51.3	24	22.9	+60.0	51.6	<b>25</b>	00.0	+60.0	52.0	<b>25</b>
26	21	34.3	+59.7	49.6	22	13.1	+59.7	49.9	22	51.6	+59.8	50.2	23	29.8	+59.9	50.6	24	07.8	+59.9	50.9	24	45.5	+60.0	51.3	25	22.9	+60.0	51.6	<b>26</b>	00.0	+60.0	52.0	<b>26</b>
27	22	34.0	+59.7	49.5	23	12.8	+59.8	49.8	23	51.4	+59.8	50.1	24	29.7	+59.9	50.5	25	07.7	+60.0	50.9	25	45.5	+59.9	51.2	26	22.9	+60.0	51.6	<b>27</b>	00.0	+60.0	52.0	<b>27</b>
28	23	33.7	+59.6	49.4	24	12.6	+59.7	49.7	24	51.2	+59.9	50.1	25	29.6	+59.9	50.4	26	07.7	+59.9	50.8	26	45.4	+60.0	51.2	27	22.9	+60.0	51.6	<b>28</b>	00.0	+60.0	52.0	<b>28</b>
29	24	33.3	+59.7	49.3	25	12.3	+59.8	49.6	25	51.1	+59.8	50.0	26	29.5	+59.9	50.4	27	07.6	+60.0	50.8	27	45.4	+60.0	51.2	28	22.9	+60.0	51.6	<b>29</b>	00.0	+60.0	52.0	<b>29</b>
30	25	33.0	+59.6	49.1	26	12.1	+59.7	49.5	26	50.9	+59.8	49.9	27	29.4	+59.9	50.3	28	07.6	+59.9	50.7	28	45.4	+60.0	51.1	29	22.9	+60.0	51.6	<b>30</b>	00.0	+60.0	52.0	<b>30</b>
31	26	32.6	+59.7	49.0	27	11.8	+59.8	49.4	27	50.7	+59.8	50.2	28	29.3	+59.8	50.5	29	07.5	+59.9	50.6	29	45.4	+59.9	51.5	30	22.9	+60.0	51.6	<b>31</b>	00.0	+60.0	52.0	<b>31</b>
32	27	32.3	+59.6	48.9	28	11.6	+59.7	49.3	28	50.5	+59.8	49.7	29	29.1	+59.9	50.1	30	07.4	+60.0	50.6	30	45.3	+60.0	51.0	31	22.9	+60.0	51.5	<b>32</b>	00.0	+60.0	52.0	<b>32</b>
33	28	31.9	+59.7	48.8	29	11.3	+59.7	49.2	29	50.3	+59.8	49.6	30	29.0	+59.9	50.1	31	07.4	+59.9	50.5	31</												

53°, 307° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.				
Dec.	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Dec.				
0	4	12.4	+59.7	126.8	3	36.4	+59.8	126.8	3	00.4	+59.9	126.9	2	24.4	+59.9	126.9	1	48.3	+59.9	127.0	1	12.2	+60.0	127.0	0	00.0	+60.0	127.0	0
1	5	12.1	+59.7	126.7	4	36.2	+59.8	126.8	4	00.3	+59.8	126.8	3	24.3	+59.9	126.9	2	48.2	+60.0	126.9	2	12.2	+60.0	127.0	1	36.1	+60.0	127.0	1
2	6	11.8	+59.7	126.6	5	36.0	+59.8	126.7	5	00.1	+59.9	126.8	4	24.2	+59.9	126.8	3	48.2	+59.9	126.9	3	12.2	+59.9	126.9	2	36.1	+60.0	127.0	2
3	7	11.5	+59.7	126.5	6	35.8	+59.8	126.6	6	00.0	+59.8	126.7	5	24.1	+59.9	126.8	4	48.1	+60.0	126.8	4	12.1	+60.0	126.9	3	36.1	+60.0	127.0	3
4	8	11.2	+59.7	126.4	7	35.6	+59.7	126.5	6	59.8	+59.9	126.6	6	24.0	+59.9	126.7	5	48.1	+59.9	126.8	5	12.1	+60.0	126.9	4	36.1	+60.0	127.0	4
5	9	10.9	+59.7	126.3	8	35.3	+59.8	126.4	7	59.7	+59.8	126.5	7	23.9	+59.9	126.7	6	48.0	+60.0	126.8	6	12.1	+60.0	126.9	5	36.1	+60.0	127.0	5
6	10	10.6	+59.7	126.2	9	35.1	+59.8	126.3	8	59.5	+59.9	126.5	8	23.8	+59.9	126.7	7	47.9	+60.0	126.8	7	12.1	+59.9	126.8	6	36.1	+60.0	127.0	6
7	11	10.3	+59.7	126.1	10	34.9	+59.8	126.3	9	59.4	+59.8	126.4	9	23.7	+59.9	126.5	8	47.9	+60.0	126.7	8	12.0	+60.0	126.8	7	36.1	+60.0	127.0	7
8	12	10.0	+59.7	126.0	11	34.7	+59.8	126.2	10	59.2	+59.9	126.3	10	23.6	+59.9	126.5	9	47.9	+59.9	126.6	9	12.0	+60.0	126.8	8	36.1	+60.0	127.0	8
9	13	09.7	+59.7	125.9	12	34.5	+59.8	126.1	11	59.1	+59.8	126.3	11	23.5	+59.9	126.4	10	47.8	+60.0	126.6	10	12.0	+60.0	126.7	9	36.1	+60.0	127.0	9
10	14	09.4	+59.7	125.8	13	34.3	+59.7	126.0	12	58.9	+59.9	126.2	12	23.4	+59.9	126.4	11	47.8	+59.9	126.5	11	12.0	+59.9	126.7	10	36.0	+60.0	126.9	10
11	15	09.1	+59.7	125.7	14	34.0	+59.8	125.9	13	58.8	+59.8	126.1	13	23.3	+59.9	126.3	12	47.7	+60.0	126.5	12	11.9	+60.0	126.8	11	36.0	+60.0	127.0	11
12	16	08.8	+59.7	125.6	15	33.8	+59.8	125.8	14	58.6	+59.8	126.0	14	23.2	+59.9	126.2	13	47.7	+59.9	126.4	13	11.9	+60.0	126.6	12	36.0	+60.0	127.0	12
13	17	08.5	+59.7	125.5	16	33.6	+59.7	125.7	15	58.4	+59.9	126.0	15	23.1	+59.9	126.2	14	47.6	+59.9	126.4	14	11.9	+60.0	126.6	13	36.0	+60.0	127.0	13
14	18	08.2	+59.7	125.4	17	33.3	+59.8	125.6	16	58.3	+59.8	125.9	16	23.0	+59.9	126.1	15	47.5	+60.0	126.4	15	11.9	+59.9	126.6	14	36.0	+60.0	127.0	14
15	19	07.9	+59.7	125.3	18	33.1	+59.8	125.5	17	58.1	+59.9	125.8	17	22.9	+59.9	126.1	16	47.5	+59.9	126.3	16	11.8	+60.0	126.6	15	36.0	+60.0	127.0	15
16	20	07.6	+59.6	125.2	19	32.9	+59.7	125.4	18	58.0	+59.8	125.7	18	22.8	+59.9	126.0	17	47.4	+60.0	126.3	17	11.8	+60.0	126.5	16	36.0	+60.0	127.0	16
17	21	07.2	+59.7	125.0	20	32.6	+59.8	125.4	19	57.8	+59.8	125.7	19	22.7	+59.9	125.9	18	47.4	+59.9	126.2	18	11.8	+60.0	126.5	17	36.0	+60.0	127.0	17
18	22	06.9	+59.7	124.9	21	32.4	+59.8	125.3	20	57.6	+59.9	125.6	20	22.6	+59.9	125.9	19	47.3	+59.9	126.2	19	11.8	+59.9	126.5	18	36.0	+60.0	127.0	18
19	23	06.6	+59.6	124.8	22	32.2	+59.7	125.2	21	57.5	+59.8	125.5	21	22.5	+59.9	125.8	20	47.2	+60.0	126.1	20	11.7	+60.0	126.4	19	36.0	+60.0	127.0	19
20	24	06.2	+59.7	124.7	23	31.9	+59.8	125.1	22	57.3	+59.8	125.4	22	22.4	+59.9	125.8	21	47.2	+59.9	126.1	21	11.7	+60.0	126.4	20	36.0	+60.0	127.0	20
21	25	05.9	+59.6	124.6	24	31.7	+59.7	125.0	23	57.1	+59.8	125.3	23	22.3	+59.9	125.7	22	47.1	+60.0	126.0	22	11.7	+60.0	126.4	21	36.0	+60.0	127.0	21
22	26	05.5	+59.7	124.5	25	31.4	+59.7	124.9	24	56.9	+59.9	125.2	24	22.2	+59.8	125.6	23	47.1	+59.9	126.0	23	11.7	+59.9	126.3	22	36.0	+60.0	127.0	22
23	27	05.2	+59.6	124.3	26	31.1	+59.8	124.8	25	56.8	+59.8	125.2	25	22.0	+59.9	125.6	24	47.0	+59.9	125.9	24	11.6	+60.0	126.3	23	36.0	+60.0	127.0	23
24	28	04.8	+59.6	124.2	27	30.9	+59.7	124.7	26	56.6	+59.8	125.1	26	21.9	+59.9	125.5	25	46.9	+60.0	125.9	25	11.6	+60.0	126.3	24	36.0	+60.0	127.0	24
25	29	04.4	+59.7	124.1	28	30.6	+59.7	124.5	27	56.4	+59.8	125.0	27	21.8	+59.9	125.4	26	46.9	+59.9	125.8	26	11.6	+60.0	126.2	25	36.0	+60.0	127.0	25
26	30	04.1	+59.6	124.0	29	30.3	+59.8	124.4	28	56.2	+59.8	124.9	28	21.7	+59.9	125.3	27	46.8	+59.9	125.8	27	11.6	+59.9	126.2	26	35.9	+60.0	127.0	26
27	31	03.7	+59.6	123.8	30	30.1	+59.7	124.3	29	56.0	+59.8	124.8	29	21.6	+59.9	125.3	28	46.7	+60.0	125.7	28	11.5	+60.0	126.6	27	35.9	+60.0	127.0	27
28	32	03.3	+59.6	123.7	31	29.8	+59.7	124.2	30	55.8	+59.8	124.7	30	21.5	+59.8	125.2	29	46.7	+59.9	125.7	29	11.5	+60.0	126.6	28	35.9	+60.0	127.0	28
29	33	02.9	+59.6	123.6	32	29.5	+59.7	124.1	31	55.6	+59.8	124.6	31	21.3	+59.9	125.1	30	46.6	+59.9	125.6	30	11.5	+59.9	126.1	29	35.9	+60.0	127.0	29
30	34	02.5	+59.6	123.4	33	29.2	+59.7	124.0	32	55.4	+59.8	124.5	32	21.2	+59.9	125.0	31	46.5	+60.0	125.6	31	11.4	+60.0	126.0	30	35.9	+60.0	127.0	30
31	35	02.1	+59.5	123.3	34	28.9	+59.7	123.9	33	55.2	+59.8	124.4	33	21.1	+59.8	125.0	32	46.5	+59.9	125.2	32	11.4	+60.0	126.0	31	35.9	+60.0	127.0	31
32	36	01.6	+59.6	123.1	35	28.6	+59.7	123.7	34	55.0	+59.8	124.3	34	20.9	+59.9	124.9	33	46.4	+59.9	125.4	33	11.4	+60.0	126.5	32	35.9	+60.0	127.0	32
33	37	01.2	+59.5	123.0	36	28.3	+59.6	123.6	35	54.8	+59.8	124.2	35	20.8	+59.8	124.8	34	46.3	+59.9	125.4	34	11.3	+60.0	126.5	33	35.9	+60.0	127.0	33
34	38	00.7	+59.6	122.8	37	27.9	+59.6	123.3	36	54.6	+59.7	123.4	36	20.5	+59.9	124.0	35	46.1	+60.0	125.2	35	11.3	+60.0	126.0	34	35.9	+60.0	127.0	34
35	39	00.3	+59.5	122.7	38	27.6	+59.7	123.2	37	54.4	+59.7	123.9	38	20.4	+59.8	124.5	37	46.1	+59.9	125.2	37	11.2	+60.0	125.8	36	35.9	+60.0	126.4	36
36	40	59.3	+59.5	122.3	40	26.9	+59.6	123.1	39	53.8	+59.8	123.8	39	20.2	+59.8	124.4	38	46.0	+59.9	125.1	38	11.2	+59.9	125.8	37	35.9	+60.0	127.0	37
37	41	58.8	+59.5	122.2	41	26.5																							

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $53^\circ$ ,  $307^\circ$

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.				
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z					
0	4	12.4	-59.8	126.8	3	36.4	-59.8	126.8	3	00.4	-59.9	126.9	2	24.4	-59.9	126.9	1	48.3	-60.0	127.0	0	36.1	-60.0	127.0	0	0.00	+60.0	53.0	<b>0</b>
1	3	12.6	-59.7	126.9	2	36.6	-59.8	126.9	2	00.5	-59.8	127.0	1	24.5	-60.0	127.0	0	48.3	-59.9	127.0	0	23.9	+60.0	53.0	1	0.00	+60.0	53.0	<b>1</b>
2	2	12.9	-59.7	127.0	1	36.8	-59.8	127.0	1	00.7	-59.9	127.0	0	24.5	-59.9	127.0	0	11.6	+59.9	53.0	0	47.7	+60.0	53.0	2	0.00	+60.0	53.0	<b>2</b>
3	1	13.2	-59.7	127.1	0	37.0	-59.8	127.1	0	00.8	-59.8	127.1	0	35.4	+59.9	52.9	1	11.5	+60.0	52.9	1	47.7	+60.0	52.9	2	23.9	+60.0	53.0	<b>3</b>
4	0	13.5	-59.7	127.2	0	22.8	+59.8	52.8	0	59.0	+59.9	52.8	1	35.3	+59.9	52.8	2	11.5	+59.9	52.9	2	47.7	+60.0	52.9	3	23.9	+60.0	52.9	<b>4</b>
5	0	46.2	+59.7	52.7	1	22.6	+59.7	52.7	1	58.9	+59.8	52.8	2	35.2	+59.9	52.8	3	11.4	+60.0	52.8	3	47.7	+60.0	52.9	4	23.9	+60.0	52.9	<b>5</b>
6	1	45.9	+59.7	52.6	2	22.3	+59.8	52.6	2	58.7	+59.9	52.7	3	35.1	+59.9	52.7	4	11.4	+59.9	52.8	4	47.7	+59.9	52.8	5	23.9	+60.0	53.0	<b>6</b>
7	2	45.6	+59.8	52.5	3	22.1	+59.8	52.6	3	58.6	+59.8	52.6	4	35.0	+59.9	52.7	5	11.3	+60.0	52.7	5	47.6	+60.0	52.8	6	23.9	+59.9	52.9	<b>7</b>
8	3	45.4	+59.7	52.4	4	21.9	+59.8	52.5	4	58.4	+59.9	52.5	5	34.9	+59.9	52.6	6	11.3	+59.9	52.7	6	47.6	+60.0	52.8	7	23.8	+60.0	53.0	<b>8</b>
9	4	45.1	+59.7	52.3	5	21.7	+59.8	52.4	5	58.3	+59.8	52.5	6	34.8	+59.9	52.6	7	11.2	+60.0	52.7	7	47.6	+60.0	52.8	8	23.8	+60.0	53.0	<b>9</b>
10	5	44.8	+59.7	52.2	6	21.5	+59.8	52.3	6	58.1	+59.9	52.4	7	34.7	+59.9	52.5	8	11.2	+59.9	52.6	8	47.6	+59.9	52.7	9	23.8	+60.0	52.9	<b>10</b>
11	6	44.5	+59.7	52.1	7	21.3	+59.8	52.2	7	58.0	+59.8	52.3	8	34.6	+59.9	52.5	9	11.1	+60.0	52.6	9	47.5	+60.0	52.7	10	23.8	+60.0	52.8	<b>11</b>
12	7	44.2	+59.7	52.0	8	21.1	+59.8	52.1	8	57.8	+59.9	52.3	9	34.5	+59.9	52.4	10	11.1	+59.9	52.5	10	47.5	+60.0	52.7	11	23.8	+60.0	53.0	<b>12</b>
13	8	43.9	+59.7	51.9	9	20.9	+59.7	52.1	9	57.7	+59.8	52.2	10	34.4	+59.9	52.3	11	11.0	+60.0	52.5	11	47.5	+60.0	52.6	12	23.8	+60.0	53.0	<b>13</b>
14	9	43.6	+59.7	51.8	10	20.6	+59.8	52.0	10	57.5	+59.9	52.1	11	34.3	+59.9	52.3	12	11.0	+59.9	52.4	12	47.5	+59.9	52.6	13	23.8	+60.0	53.0	<b>14</b>
15	10	43.3	+59.7	51.7	11	20.4	+59.8	51.9	11	57.4	+59.8	52.0	12	34.2	+59.9	52.2	13	10.9	+60.0	52.4	13	47.4	+60.0	52.6	14	23.8	+60.0	52.8	<b>15</b>
16	11	43.0	+59.7	51.6	12	20.2	+59.8	51.8	12	57.2	+59.9	52.0	13	34.1	+59.9	52.2	14	10.9	+59.9	52.4	14	47.4	+60.0	52.6	15	23.8	+60.0	53.0	<b>16</b>
17	12	42.7	+59.7	51.5	13	20.0	+59.8	51.7	13	57.1	+59.8	51.9	14	34.0	+59.9	52.1	15	10.8	+59.9	52.3	15	47.4	+60.0	52.5	16	23.8	+60.0	53.0	<b>17</b>
18	13	42.4	+59.7	51.4	14	19.8	+59.7	51.6	14	56.9	+59.9	51.8	15	33.9	+59.9	52.0	16	10.7	+60.0	52.3	16	47.4	+59.9	52.5	17	23.8	+60.0	53.0	<b>18</b>
19	14	42.1	+59.7	51.3	15	19.5	+59.8	51.5	15	56.8	+59.8	51.8	16	33.8	+59.9	52.0	17	10.7	+59.9	52.2	17	47.3	+60.0	52.5	18	23.8	+60.0	53.0	<b>19</b>
20	15	41.8	+59.7	51.2	16	19.3	+59.8	51.4	16	56.6	+59.9	51.7	17	33.7	+59.9	51.9	18	10.6	+60.0	52.2	18	47.3	+60.0	52.4	19	23.8	+60.0	52.7	<b>20</b>
21	21	41.5	+59.7	51.1	17	19.1	+59.8	51.4	17	56.5	+59.8	51.6	18	33.6	+59.9	51.9	19	10.6	+59.9	52.1	19	47.3	+60.0	52.4	20	23.8	+60.0	52.7	<b>21</b>
22	22	41.2	+59.7	51.0	18	18.9	+59.7	51.3	18	56.3	+59.8	51.5	19	33.5	+59.9	51.8	20	10.5	+59.9	52.1	20	47.3	+59.9	52.4	21	23.8	+60.0	53.0	<b>22</b>
23	23	40.9	+59.7	50.9	19	18.6	+59.8	51.2	19	56.1	+59.9	51.4	20	33.4	+59.9	51.7	21	10.4	+60.0	52.0	21	47.2	+60.0	52.3	22	23.8	+59.9	52.7	<b>23</b>
24	24	40.6	+59.6	50.8	20	18.4	+59.7	51.1	20	56.0	+59.8	51.4	21	33.3	+59.9	51.7	22	10.4	+59.9	52.0	22	47.2	+60.0	52.3	23	23.7	+60.0	53.0	<b>24</b>
25	25	40.2	+59.7	50.7	21	18.1	+59.8	51.0	21	55.8	+59.8	51.3	22	33.2	+59.9	51.6	23	10.3	+60.0	51.9	23	47.2	+59.9	52.3	24	23.7	+60.0	52.6	<b>25</b>
26	26	39.9	+59.7	50.6	22	17.9	+59.8	50.9	22	55.6	+59.9	51.2	23	33.1	+59.9	51.5	24	10.3	+59.9	51.9	24	47.1	+60.0	52.2	25	23.7	+60.0	52.6	<b>26</b>
27	27	39.6	+59.6	50.5	23	17.7	+59.7	50.8	23	55.5	+59.8	51.1	24	33.0	+59.9	51.5	25	10.2	+59.9	51.8	25	47.1	+60.0	52.2	26	23.7	+60.0	53.0	<b>27</b>
28	28	39.2	+59.7	50.3	24	17.4	+59.7	50.7	24	55.3	+59.8	51.0	25	32.9	+59.8	51.4	26	10.1	+60.0	51.8	26	47.1	+60.0	52.2	27	23.7	+60.0	53.0	<b>28</b>
29	29	38.9	+59.7	50.2	25	17.1	+59.8	50.6	25	55.1	+59.8	51.0	26	32.7	+59.9	51.3	27	10.1	+59.9	51.7	27	47.1	+59.9	52.1	28	23.7	+60.0	53.0	<b>29</b>
30	30	38.6	+59.6	50.1	26	16.9	+59.7	50.5	26	54.9	+59.8	50.9	27	32.6	+59.9	51.3	28	10.0	+59.9	51.7	28	47.0	+60.0	52.1	29	23.7	+60.0	52.5	<b>30</b>
31	31	38.2	+59.6	50.0	27	16.6	+59.8	50.4	27	54.7	+59.8	50.8	28	32.5	+59.9	51.2	29	0.9	+60.0	51.6	29	47.0	+60.0	52.5	30	23.7	+60.0	53.0	<b>31</b>
32	32	37.8	+59.7	49.9	28	16.4	+59.7	50.3	28	54.5	+59.8	50.7	29	32.4	+59.9	51.1	30	0.9	+59.9	51.6	30	47.0	+59.9	52.0	31	23.7	+60.0	53.0	<b>32</b>
33	33	37.5	+59.6	49.7	29	16.1	+59.7	50.2	29	54.4	+59.8	50.6	30	32.3	+59.8	51.0	31	0.8	+59.9	51.5	31	46.9	+60.0	52.0	32	23.7	+60.0	53.0	<b>33</b>
34	34	35.1	+59.6	48.9	35	14.3	+59.7	49.5	35	54.2	+59.8	50.5	36	31.5	+59.8	50.6	37	0.9	+59.9	51.1	37	46.7	+60.0	51.7	38	23.6	+60.0	53.0	<b>34</b>
40	40	34.7	+59.6	48.8	36	14.0	+59.7	49.3	36	52.9	+59.8	49.9	37	31.3	+59.9	50.5	38	0.9	+60.0	51.1	38	46.7	+60.0	51.7	39	23.6	+60.0	52.3	<b>40</b>
41	41	34.3	+59.5	48.6	37	13.7	+59.6	49.2	37	52.7	+59.7	49.8	38	31.2	+59.8	50.4	39	0.9	+59.9	51.0	39	46.7	+59.9	51.7	40	23.6	+60.0	52.3	<b>41</b>
42	42	33.8	+59.5	48.5	38	13.3	+59.7	49.1	38	52.4	+59.8	49.7	39	31.0	+59.8	50.3	40	0.9	+59.9	50.9	40	46.6	+60.0						

54°, 306° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
Dec.	Hc	d	Z	Dec.																					
0	4 06.5	+59.7	125.8	3 31.3	+59.8	125.9	2 56.2	+59.8	125.9	2 21.0	+59.9	125.9	1 45.8	+59.9	126.0	1 10.5	+60.0	126.0	0 35.3	+60.0	126.0	0 00.0	+60.0	126.0	0
1	5 06.2	+59.7	125.7	4 31.1	+59.8	125.8	3 56.0	+59.9	125.8	3 20.9	+59.9	125.9	2 45.7	+60.0	125.9	2 10.5	+60.0	126.0	1 35.3	+60.0	126.0	1 00.0	+60.0	126.0	1
2	6 05.9	+59.7	125.6	5 30.9	+59.8	125.7	4 55.9	+59.8	125.8	4 20.8	+59.9	125.8	3 45.7	+59.9	125.9	3 10.5	+60.0	125.9	2 35.3	+59.9	126.0	2 00.0	+60.0	126.0	2
3	7 05.6	+59.7	125.5	6 30.7	+59.8	125.6	5 55.7	+59.9	125.7	5 20.7	+59.9	125.8	4 45.6	+60.0	125.8	4 10.5	+59.9	125.9	3 35.2	+60.0	126.0	3 00.0	+60.0	126.0	3
4	8 05.3	+59.7	125.4	7 30.5	+59.8	125.5	6 55.6	+59.8	125.6	6 20.6	+59.9	125.7	5 45.6	+59.9	125.8	5 10.4	+60.0	125.9	4 35.2	+60.0	125.9	4 00.0	+60.0	126.0	4
5	9 05.0	+59.7	125.3	8 30.3	+59.7	125.4	7 55.4	+59.9	125.5	7 20.5	+59.9	125.6	6 45.5	+59.9	125.7	6 10.4	+60.0	125.8	5 35.2	+60.0	125.9	5 00.0	+60.0	126.0	5
6	10 04.7	+59.7	125.2	9 30.0	+59.8	125.3	8 55.3	+59.8	125.5	8 20.4	+59.9	125.6	7 45.4	+60.0	125.7	7 10.4	+60.0	125.8	6 35.2	+60.0	125.9	6 00.0	+60.0	126.0	6
7	11 04.4	+59.7	125.1	10 29.8	+59.8	125.2	9 55.1	+59.9	125.4	9 20.3	+59.9	125.5	8 45.4	+59.9	125.7	8 10.4	+59.9	125.8	7 35.2	+60.0	125.9	7 00.0	+60.0	126.0	7
8	12 04.1	+59.7	125.0	11 29.6	+59.8	125.2	10 55.0	+59.8	125.3	10 20.2	+59.9	125.5	9 45.3	+60.0	125.6	9 10.3	+60.0	125.8	8 35.2	+60.0	125.9	8 00.0	+60.0	126.0	8
9	13 03.8	+59.7	124.9	12 29.4	+59.7	125.1	11 54.8	+59.9	125.2	11 20.1	+59.9	125.4	10 45.3	+59.9	125.6	10 10.3	+60.0	125.7	9 35.2	+60.0	125.9	9 00.0	+60.0	126.0	9
10	14 03.5	+59.6	124.8	13 29.1	+59.8	125.0	12 54.7	+59.8	125.2	12 20.0	+59.9	125.4	11 45.2	+60.0	125.5	11 10.3	+60.0	125.7	10 35.2	+60.0	125.9	10 00.0	+60.0	126.0	10
11	15 03.1	+59.7	124.7	14 28.9	+59.8	124.9	13 54.5	+59.8	125.1	13 19.9	+59.9	125.3	12 45.2	+59.9	125.5	12 10.3	+59.9	125.7	11 35.2	+60.0	125.8	11 00.0	+60.0	126.0	11
12	16 02.8	+59.7	124.6	15 28.7	+59.8	124.8	14 54.3	+59.9	125.0	14 19.8	+59.9	125.2	13 45.1	+60.0	125.4	13 10.2	+60.0	125.6	12 35.2	+60.0	125.8	12 00.0	+60.0	126.0	12
13	17 02.5	+59.7	124.5	16 28.5	+59.7	124.7	15 54.2	+59.8	124.9	15 19.7	+59.9	125.2	14 45.1	+59.9	125.4	14 10.2	+60.0	125.6	13 35.2	+60.0	125.8	13 00.0	+60.0	126.0	13
14	18 02.2	+59.7	124.4	17 28.2	+59.8	124.6	16 54.0	+59.9	124.9	16 19.6	+59.9	125.1	15 45.0	+59.9	125.4	15 10.2	+60.0	125.6	14 35.2	+60.0	125.8	14 00.0	+60.0	126.0	14
15	19 01.9	+59.6	124.2	18 28.0	+59.7	124.5	17 53.9	+59.8	124.8	17 19.5	+59.9	125.1	16 44.9	+60.0	125.3	16 10.2	+59.9	125.5	15 35.2	+60.0	125.8	15 00.0	+60.0	126.0	15
16	20 01.5	+59.7	124.1	19 27.7	+59.8	124.4	18 53.7	+59.8	124.7	18 19.4	+59.9	125.0	17 44.9	+59.9	125.3	17 10.1	+60.0	125.5	16 35.2	+60.0	125.8	16 00.0	+60.0	126.0	16
17	21 01.2	+59.7	124.0	20 27.5	+59.8	124.3	19 53.5	+59.9	124.6	19 19.3	+59.9	124.9	18 44.8	+60.0	125.2	18 10.1	+60.0	125.5	17 35.2	+60.0	125.7	17 00.0	+60.0	126.0	17
18	22 00.9	+59.6	123.9	21 27.3	+59.7	124.2	20 53.4	+59.8	124.6	20 19.2	+59.9	124.9	19 44.8	+59.9	125.5	19 10.1	+59.9	125.7	18 35.2	+59.9	125.9	18 00.0	+60.0	126.0	18
19	23 00.5	+59.7	123.8	22 27.0	+59.7	124.1	21 53.2	+59.8	124.5	21 19.1	+59.9	124.8	20 44.7	+59.9	125.1	20 10.0	+60.0	124.5	19 35.1	+60.0	125.7	19 00.0	+60.0	126.0	19
20	24 00.2	+59.6	123.7	23 26.7	+59.8	124.0	22 53.0	+59.8	124.4	22 19.0	+59.9	124.7	21 44.6	+60.0	125.1	21 10.0	+60.0	125.4	20 35.1	+60.0	125.7	20 00.0	+60.0	126.0	20
21	24 59.8	+59.7	123.6	24 26.5	+59.7	123.9	23 52.8	+59.9	124.3	23 18.9	+59.8	124.7	22 44.6	+59.9	125.0	22 10.0	+60.0	125.4	21 35.1	+60.0	125.7	21 00.0	+60.0	126.0	21
22	25 59.5	+59.6	123.4	25 26.2	+59.8	123.8	24 52.7	+59.8	124.2	24 18.7	+59.9	124.6	23 44.5	+59.9	125.0	23 10.0	+59.9	125.3	22 35.1	+60.0	125.7	22 00.0	+60.0	126.0	22
23	26 59.1	+59.6	123.3	26 26.0	+59.7	123.7	25 52.5	+59.8	124.1	25 18.6	+59.9	124.5	24 44.4	+60.0	124.9	24 09.9	+60.0	125.3	23 35.1	+60.0	125.7	23 00.0	+60.0	126.0	23
24	27 58.7	+59.6	123.2	27 25.7	+59.7	123.6	26 52.3	+59.8	124.1	26 18.5	+59.9	124.5	25 44.4	+59.9	124.9	25 09.9	+60.0	125.3	24 35.1	+60.0	125.6	24 00.0	+60.0	126.0	24
25	28 58.3	+59.7	123.1	28 25.4	+59.7	123.5	27 52.1	+59.8	124.0	27 18.4	+59.9	124.4	26 44.3	+59.9	124.8	26 09.9	+59.9	125.2	25 35.1	+60.0	125.6	25 00.0	+60.0	126.0	25
26	29 58.0	+59.6	122.9	29 25.1	+59.8	123.4	28 51.9	+59.8	123.9	28 18.3	+59.8	124.3	27 44.2	+60.0	124.8	27 09.8	+60.0	125.2	26 35.1	+60.0	125.6	26 00.0	+60.0	126.0	26
27	30 57.6	+59.6	122.8	30 24.9	+59.7	123.3	29 51.7	+59.8	123.8	29 18.1	+59.9	124.2	28 44.2	+59.9	124.7	28 09.8	+60.0	125.2	27 35.1	+60.0	125.6	27 00.0	+60.0	126.0	27
28	31 57.2	+59.6	122.7	31 24.6	+59.7	123.2	30 51.5	+59.8	123.7	30 18.0	+59.9	124.2	29 44.1	+59.9	124.7	29 09.8	+60.0	125.1	28 35.1	+60.0	125.6	28 00.0	+60.0	126.0	28
29	32 56.8	+59.5	122.5	32 24.3	+59.7	123.1	31 51.3	+59.8	123.6	31 17.9	+59.8	124.1	30 44.0	+60.0	124.6	30 09.8	+59.9	125.1	29 35.1	+60.0	125.5	29 00.0	+60.0	126.0	29
30	33 56.3	+59.6	122.4	33 24.0	+59.6	122.9	32 51.1	+59.8	123.5	32 17.7	+59.9	124.0	31 44.0	+59.9	124.5	31 09.7	+60.0	125.0	30 35.1	+60.0	125.5	30 00.0	+60.0	126.0	30
31	34 55.9	+59.6	122.2	34 23.6	+59.7	122.8	33 50.9	+59.8	123.4	33 17.6	+59.9	123.9	32 43.9	+59.9	124.5	32 09.7	+60.0	125.0	31 35.1	+60.0	125.5	31 00.0	+60.0	126.0	31
32	35 55.5	+59.5	122.1	35 23.3	+59.7	122.7	34 50.7	+59.7	123.3	34 17.5	+59.8	123.9	33 43.8	+59.9	124.4	33 09.7	+59.9	125.0	32 35.1	+59.9	125.5	32 00.0	+60.0	126.0	32
33	36 55.0	+59.5	121.9	36 23.0	+59.7	122.6	35 50.4	+59.8	123.2	35 17.3	+59.9	123.8	34 43.7	+60.0	124.9	34 09.6	+60.0	125.3	33 35.0	+60.0	125.5	33 00.0	+60.0	126.0	33
34	37 54.5	+59.6	121.8	38 22.8	+59.8	122.7	37 50.0	+59.7	123.0	37 17.0	+59.9	123.6	36 43.6	+59.9	124.2	36 09.6	+59.9	124.8	35 35.0	+60.0	125.4	35 00.0	+60.0	126.0	35
35	38 54.1	+59.5	121.6	39 22.5	+59.7	122.3	38 49.7	+59.8	122.8	38 16.9	+59.8	123.5	37 43.5	+59.9	124.2	37 09.5	+60.0	124.8	36 35.0	+60.0	125.4	36 00.0	+60.0	126.0	36
36	40 53.0	+59.5	121.3	40 21.6	+59.6	122.0	39 49.5	+59.7	122.7	39 16.7	+59.9	123.4	38 43.4	+59.9	124.1	38 09.5	+59.9	124.7	37 35.0	+60.0	125.4				

**LATITUDE CONTRARY NAME TO DECLINATION**      **L.H.A. 54°, 306°**

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
	Hc	d	Z	Hc	d	Z																			
0	4 06.5 -59.7	125.8		3 31.3 -59.7	125.9		2 56.2 -59.9	125.9		2 21.0 -59.9	125.9		1 45.8 -60.0	126.0		1 10.5 -60.0	126.0		0 35.3 -60.0	126.0		0 00.0 +60.0	54.0		0
1	3 06.8 -59.7	125.9		2 31.6 -59.8	125.9		1 56.3 -59.8	126.0		1 21.1 -59.9	126.0		0 45.8 -59.9	126.0		0 10.5 -59.9	126.0		0 24.7 +60.0	54.0		1 00.0 +60.0	54.0		1
2	2 07.1 -59.8	126.0		1 31.8 -59.8	126.0		0 56.5 -59.9	126.0		0 21.2 -59.9	126.0		0 14.1 +60.0	54.0		0 49.4 +60.0	54.0		1 24.7 +60.0	54.0		2 00.0 +60.0	54.0		2
3	1 07.3 -59.7	126.1		0 32.0 -59.8	126.1		0 03.4 +59.8	53.9		0 38.7 +59.9	53.9		1 14.1 +59.9	53.9		1 49.4 +60.0	53.9		2 24.7 +60.0	54.0		3 00.0 +60.0	54.0		3
4	0 07.6 -59.7	126.2		0 27.8 +59.8	53.8		1 03.2 +59.9	53.8		1 38.6 +59.9	53.8		2 14.0 +60.0	53.9		2 49.4 +60.0	53.9		3 24.7 +60.0	53.9		4 00.0 +60.0	54.0		4
5	0 52.1 +59.7	53.7		1 27.6 +59.8	53.7		2 03.1 +59.8	53.8		2 38.5 +59.9	53.8		3 14.0 +59.9	53.8		3 49.4 +59.9	53.9		4 24.7 +60.0	53.9		5 00.0 +60.0	54.0		5
6	1 51.8 +59.7	53.6		2 27.4 +59.7	53.6		3 02.9 +59.8	53.7		3 38.4 +59.9	53.7		4 13.9 +60.0	53.8		4 49.3 +60.0	53.8		5 24.7 +60.0	53.9		6 00.0 +60.0	54.0		6
7	2 51.5 +59.7	53.5		3 27.1 +59.8	53.6		4 02.8 +59.8	53.6		4 38.3 +59.9	53.7		5 13.9 +59.9	53.7		5 49.3 +60.0	53.8		6 24.7 +60.0	53.9		7 00.0 +60.0	54.0		7
8	3 51.2 +59.7	53.4		4 26.9 +59.8	53.5		5 02.6 +59.9	53.5		5 38.2 +59.9	53.6		6 13.8 +59.9	53.7		6 49.3 +60.0	53.8		7 24.7 +60.0	53.9		8 00.0 +60.0	54.0		8
9	4 50.9 +59.7	53.3		5 26.7 +59.8	53.4		6 02.5 +59.8	53.5		6 38.1 +59.9	53.6		7 13.7 +60.0	53.7		7 49.3 +59.9	53.8		8 24.7 +60.0	53.9		9 00.0 +60.0	54.0		9
10	5 50.6 +59.7	53.2		6 26.5 +59.8	53.3		7 02.3 +59.9	53.4		7 38.0 +59.9	53.5		8 13.7 +59.9	53.6		8 49.2 +60.0	53.7		9 24.7 +60.0	53.9		10 00.0 +60.0	54.0		10
11	6 50.3 +59.7	53.1		7 26.3 +59.8	53.2		8 02.2 +59.8	53.3		8 37.9 +60.0	53.4		9 13.6 +60.0	53.6		9 49.2 +60.0	53.8		10 24.7 +60.0	53.8		11 00.0 +60.0	54.0		11
12	7 50.0 +59.7	53.0		8 26.1 +59.7	53.1		9 02.0 +59.9	53.3		9 37.9 +59.9	53.4		10 13.6 +59.9	53.5		10 49.2 +60.0	53.7		11 24.7 +60.0	53.8		12 00.0 +60.0	54.0		12
13	8 49.7 +59.7	52.9		9 25.8 +59.8	53.0		10 01.9 +59.8	53.2		10 37.8 +59.9	53.3		11 13.5 +60.0	53.5		11 49.2 +59.9	53.6		12 24.7 +59.9	53.8		13 00.0 +60.0	54.0		13
14	9 49.4 +59.7	52.8		10 25.6 +59.8	53.0		11 01.7 +59.8	53.1		11 37.7 +59.9	53.3		12 13.5 +59.9	53.4		12 49.1 +60.0	53.6		13 24.6 +60.0	53.8		14 00.0 +60.0	54.0		14
15	10 49.1 +59.7	52.7		11 25.4 +59.8	52.9		12 01.5 +59.9	53.0		12 37.6 +59.9	53.2		13 13.4 +60.0	53.4		13 49.1 +60.0	53.6		14 24.6 +60.0	53.8		15 00.0 +60.0	54.0		15
16	11 48.8 +59.7	52.6		12 25.2 +59.7	52.8		13 01.4 +59.8	53.0		13 37.5 +59.8	53.1		14 13.4 +59.9	53.3		14 49.1 +60.0	53.6		15 24.6 +60.0	53.8		16 00.0 +60.0	54.0		16
17	12 48.5 +59.7	52.5		13 24.9 +59.8	52.7		14 01.2 +59.9	52.9		14 37.3 +59.9	53.1		15 13.3 +59.9	53.3		15 49.1 +59.9	53.5		16 24.6 +60.0	53.8		17 00.0 +60.0	54.0		17
18	13 48.2 +59.7	52.4		14 24.7 +59.8	52.6		15 01.1 +59.8	52.8		15 37.2 +59.9	53.0		16 13.2 +60.0	53.3		16 49.0 +60.0	53.5		17 24.6 +60.0	53.7		18 00.0 +60.0	54.0		18
19	14 47.9 +59.7	52.3		15 24.5 +59.8	52.5		16 00.9 +59.8	52.7		16 37.1 +59.9	53.0		17 13.2 +59.9	53.2		17 49.0 +60.0	53.5		18 24.6 +60.0	53.7		19 00.0 +60.0	54.0		19
20	15 47.6 +59.6	52.2		16 24.3 +59.7	52.4		17 00.7 +59.9	52.7		17 37.0 +59.9	52.9		18 13.1 +60.0	53.2		18 49.0 +60.0	53.4		19 24.6 +60.0	53.7		20 00.0 +60.0	54.0		20
21	16 47.2 +59.7	52.1		17 24.0 +59.8	52.3		18 00.6 +59.8	52.6		18 36.9 +59.9	52.8		19 13.1 +59.9	53.1		19 49.0 +59.9	53.4		20 24.6 +60.0	53.7		21 00.0 +60.0	54.0		21
22	17 46.9 +59.7	52.0		18 23.8 +59.7	52.2		19 00.4 +59.8	52.5		19 36.8 +59.9	52.8		20 13.0 +59.9	53.1		20 48.9 +60.0	53.4		21 24.6 +60.0	53.7		22 00.0 +60.0	54.0		22
23	18 46.6 +59.7	51.9		19 23.5 +59.8	52.1		20 00.2 +59.9	52.4		20 36.7 +59.9	52.7		21 12.9 +60.0	53.0		21 48.9 +60.0	53.3		22 24.6 +60.0	53.7		23 00.0 +60.0	54.0		23
24	19 46.3 +59.6	51.8		20 23.3 +59.7	52.0		21 00.1 +59.8	52.3		21 36.6 +59.9	52.7		22 12.9 +59.9	53.0		22 48.9 +59.9	53.3		23 24.6 +60.0	53.6		24 00.0 +60.0	54.0		24
25	20 45.9 +59.7	51.6		21 23.0 +59.8	51.9		21 59.9 +59.8	52.3		22 36.5 +59.9	52.6		23 12.8 +59.9	52.9		23 48.8 +60.0	53.3		24 24.6 +60.0	53.6		25 00.0 +60.0	54.0		25
26	21 45.6 +59.7	51.5		22 22.8 +59.7	51.8		22 59.7 +59.9	52.2		23 36.4 +59.9	52.5		24 12.7 +60.0	52.9		24 48.8 +60.0	53.2		25 24.6 +60.0	53.6		26 00.0 +60.0	54.0		26
27	22 45.3 +59.6	51.4		23 22.5 +59.8	51.7		23 59.6 +59.8	52.1		24 36.3 +59.9	52.5		25 12.7 +59.9	52.8		25 48.8 +60.0	53.2		26 24.6 +60.0	53.6		27 00.0 +60.0	54.0		27
28	23 44.9 +59.7	51.3		24 22.3 +59.7	51.6		24 59.4 +59.8	52.0		25 36.2 +59.8	52.4		26 12.6 +59.9	52.8		26 48.8 +59.9	53.2		27 24.6 +59.9	53.6		28 00.0 +60.0	54.0		28
29	24 44.6 +59.6	51.2		25 22.0 +59.8	51.5		25 59.2 +59.8	51.9		26 36.0 +59.9	52.3		27 12.5 +60.0	52.7		27 48.7 +60.0	53.1		28 24.5 +60.0	53.6		29 00.0 +60.0	54.0		29
30	25 44.2 +59.6	51.1		26 21.8 +59.7	51.4		26 59.0 +59.8	51.8		27 35.9 +59.9	52.2		28 12.5 +59.9	52.7		28 48.7 +60.0	53.1		29 24.5 +60.0	53.5		30 00.0 +60.0	54.0		30
31	26 43.8 +59.7	50.9		27 21.5 +59.7	51.3		27 58.8 +59.8	51.7		28 35.8 +59.9	52.2		29 12.4 +59.9	52.6		29 48.7 +59.9	53.1		30 24.5 +60.0	53.5		31 00.0 +60.0	54.0		31
32	27 43.5 +59.6	50.8		28 21.2 +59.7	51.2		28 58.6 +59.8	51.7		29 35.7 +59.8	52.1		30 12.3 +60.0	52.5		30 48.6 +60.0	53.0		31 24.5 +60.0	53.4		32 00.0 +60.0	54.0		32
33	28 43.1 +59.6	50.7		29 20.9 +59.8	51.1		29 58.4 +59.8	51.6		30 35.5 +59.9	52.0		31 12.3 +59.9	52.5		31 48.6 +60.0	53.0		32 24.5 +60.0	53.5		33 00.0 +60.0	54.0		33
34	29 42.7 +59.6	50.6		30 20.7 +59.7	51.0		30 58.2 +59.8	51.5		31 35.4 +59.9	51.9		32 12.2 +59.9	52.4		32 48.6 +59.9	53.2		33 24.5 +60.0	53.5		34 00.0 +60.0	54.0		34
35	30 42.3 +59.6	50.4		31 20.4 +59.7	50.9		31 58.0 +59.8	51.4		32 35.3 +59.8	51.9		33 12.1 +59.9	52.4		33 48.5 +60.0	52.9		34 24.5 +60.0	53.4		35 00.0 +60.0	54.0		35
36	31 42.0 +59.6	50.3		32 20.1 +59.7	50.8		32 57.8 +59.8	51.3		33 35.1 +59.9	51.8		34 12.0 +60.0	52.3		34 48.5 +60.0	52.9		35 24.5 +60.0	53.4		36 00.0 +60.0	54.0		36
37	32 41.5 +59.6	50.2		33 19.8 +59.6	50.7		33 57.6 +59.8	51.2		34 35.0 +59.9	51.7		35 12.0 +59.9	52.2		35 48.5 +60.0	53.4		36 24.5 +60.0	53.7		37 00.0 +60.0	54.0		37
38	33 41.1 +59.6	50.0		34 19.4 +59.7	50.																				

55°, 305° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
Dec.	Hc	d	Z	Dec.																					
0	4 00.5 +59.7	124.8		3 26.2 +59.8	124.9		2 51.9 +59.9	124.9		2 17.6 +59.9	124.9		1 43.2 +60.0	125.0		1 08.8 +60.0	125.0		0 34.4 +60.0	125.0		0 00.0 +60.0	125.0		0
1	5 00.2 +59.7	124.7		4 26.0 +59.8	124.8		3 51.8 +59.8	124.8		3 17.5 +59.9	124.9		2 43.2 +59.9	124.9		2 08.8 +60.0	125.0		1 34.4 +60.0	125.0		1 00.0 +60.0	125.0		1
2	5 59.9 +59.7	124.6		5 25.8 +59.8	124.7		4 51.6 +59.9	124.8		4 17.4 +59.9	124.8		3 43.1 +59.9	124.9		3 08.8 +59.9	124.9		2 34.4 +60.0	125.0		2 00.0 +60.0	125.0		2
3	6 59.6 +59.7	124.5		6 25.6 +59.7	124.6		5 51.5 +59.8	124.7		5 17.3 +59.9	124.8		4 43.0 +60.0	124.8		4 08.7 +60.0	124.9		3 34.4 +60.0	125.0		3 00.0 +60.0	125.0		3
4	7 59.3 +59.7	124.4		7 25.3 +59.8	124.5		6 51.3 +59.9	124.6		6 17.2 +59.9	124.7		5 43.0 +59.9	124.8		5 08.7 +60.0	124.9		4 34.4 +60.0	124.9		4 00.0 +60.0	125.0		4
5	8 59.0 +59.7	124.3		8 25.1 +59.8	124.4		7 51.2 +59.8	124.5		7 17.1 +59.9	124.6		6 42.9 +60.0	124.7		6 08.7 +60.0	124.8		5 34.4 +60.0	124.9		5 00.0 +60.0	125.0		5
6	9 58.7 +59.7	124.2		9 24.9 +59.8	124.3		8 51.0 +59.8	124.5		8 17.0 +59.9	124.6		7 42.9 +59.9	124.7		7 08.7 +59.9	124.8		6 34.4 +60.0	124.9		6 00.0 +60.0	125.0		6
7	10 58.4 +59.7	124.1		10 24.7 +59.7	124.2		9 50.8 +59.9	124.4		9 16.9 +59.9	124.5		8 42.8 +60.0	124.7		8 08.6 +60.0	124.8		7 34.4 +60.0	124.9		7 00.0 +60.0	125.0		7
8	11 58.1 +59.6	124.0		11 24.4 +59.8	124.2		10 50.7 +59.8	124.3		10 16.8 +59.9	124.5		9 42.8 +59.9	124.6		9 08.6 +60.0	124.8		8 34.4 +60.0	124.9		8 00.0 +60.0	125.0		8
9	12 57.7 +59.7	123.9		12 24.2 +59.8	124.1		11 50.5 +59.9	124.2		11 16.7 +59.9	124.4		10 42.7 +60.0	124.6		10 08.6 +60.0	124.7		9 34.4 +60.0	124.9		9 00.0 +60.0	125.0		9
10	13 57.4 +59.7	123.8		13 24.0 +59.7	124.0		12 50.4 +59.8	124.2		12 16.6 +59.9	124.4		11 42.7 +59.9	124.5		11 08.6 +59.9	124.7		10 34.4 +59.9	124.9		10 00.0 +60.0	125.0		10
11	14 57.1 +59.7	123.7		14 23.7 +59.8	123.9		13 50.2 +59.8	124.1		13 16.5 +59.9	124.3		12 42.6 +59.9	124.5		12 08.5 +60.0	124.7		11 34.3 +60.0	124.8		11 00.0 +60.0	125.0		11
12	15 56.8 +59.7	123.6		15 23.5 +59.8	123.8		14 50.0 +59.9	124.0		14 16.4 +59.9	124.2		13 42.5 +60.0	124.4		13 08.5 +60.0	124.6		12 34.3 +60.0	124.8		12 00.0 +60.0	125.0		12
13	16 56.5 +59.6	123.5		16 23.3 +59.7	123.7		15 49.9 +59.8	123.9		15 16.3 +59.9	124.2		14 42.5 +59.9	124.4		14 08.5 +60.0	124.6		13 34.3 +60.0	124.8		13 00.0 +60.0	125.0		13
14	17 56.1 +59.7	123.3		17 23.0 +59.8	123.6		16 49.7 +59.8	123.9		16 16.2 +59.9	124.1		15 42.4 +60.0	124.3		15 08.5 +59.9	124.6		14 34.3 +60.0	124.8		14 00.0 +60.0	125.0		14
15	18 55.8 +59.7	123.2		18 22.8 +59.7	123.5		17 49.5 +59.9	123.8		17 16.1 +59.9	124.0		16 42.4 +59.9	124.3		16 08.4 +60.0	124.5		15 34.3 +60.0	124.8		15 00.0 +60.0	125.0		15
16	19 55.5 +59.6	123.1		19 22.5 +59.8	123.4		18 49.4 +59.8	123.7		18 16.0 +59.8	124.0		17 42.3 +59.9	124.3		17 08.4 +60.0	124.5		16 34.3 +60.0	124.8		16 00.0 +60.0	125.0		16
17	20 55.1 +59.7	123.0		20 22.3 +59.7	123.3		19 49.2 +59.8	123.6		19 15.8 +59.9	123.9		18 42.2 +60.0	124.2		18 08.4 +60.0	124.5		17 34.3 +60.0	124.7		17 00.0 +60.0	125.0		17
18	21 54.8 +59.6	122.9		21 22.0 +59.8	123.2		20 49.0 +59.8	123.5		20 15.7 +59.9	123.9		19 42.2 +59.9	124.4		19 08.4 +59.9	124.4		18 34.3 +60.0	124.7		18 00.0 +60.0	125.0		18
19	22 54.4 +59.7	122.8		22 21.8 +59.7	123.1		21 48.8 +59.9	123.5		21 15.6 +59.9	123.8		20 41.2 +59.9	124.1		20 08.3 +60.0	124.2		19 34.3 +60.0	124.7		19 00.0 +60.0	125.0		19
20	23 54.1 +59.6	122.7		23 21.5 +59.8	123.0		22 48.7 +59.8	123.4		22 15.5 +59.9	123.7		21 42.0 +60.0	124.1		21 08.3 +60.0	124.4		20 34.3 +60.0	124.7		20 00.0 +60.0	125.0		20
21	24 53.7 +59.6	122.5		24 21.3 +59.7	122.9		23 48.5 +59.8	123.3		23 15.4 +59.9	123.7		22 42.0 +59.9	124.0		22 08.3 +59.9	124.3		21 34.3 +60.0	124.7		21 00.0 +60.0	125.0		21
22	25 53.3 +59.7	122.4		25 21.0 +59.7	122.8		24 48.3 +59.8	123.2		24 15.3 +59.9	123.6		23 41.9 +60.0	124.0		23 08.2 +60.0	124.3		22 34.3 +60.0	124.7		22 00.0 +60.0	125.0		22
23	26 53.0 +59.6	122.3		26 20.7 +59.7	122.7		25 48.1 +59.8	123.1		25 15.2 +59.8	123.5		24 41.9 +59.9	123.9		24 08.2 +60.0	124.3		23 34.3 +60.0	124.6		23 00.0 +60.0	125.0		23
24	27 52.6 +59.6	122.2		27 20.4 +59.8	122.6		26 47.9 +59.8	123.0		26 15.0 +59.9	123.4		25 41.8 +59.9	123.9		25 08.2 +60.0	124.2		24 34.3 +59.9	124.6		24 00.0 +60.0	125.0		24
25	28 52.2 +59.6	122.0		28 20.2 +59.7	122.5		27 47.7 +59.8	122.9		27 14.9 +59.9	123.4		26 41.7 +59.9	123.8		26 08.2 +59.9	124.2		25 34.2 +60.0	124.6		25 00.0 +60.0	125.0		25
26	29 51.8 +59.6	121.9		29 19.9 +59.7	122.4		28 47.5 +59.8	122.8		28 14.8 +59.9	123.3		27 41.6 +60.0	123.7		27 08.1 +60.0	124.2		26 34.2 +60.0	124.6		26 00.0 +60.0	125.0		26
27	30 51.4 +59.6	121.8		30 19.6 +59.7	122.3		29 47.3 +59.8	122.8		29 14.7 +59.8	123.2		28 41.6 +59.9	123.7		28 08.1 +60.0	124.1		27 34.2 +60.0	124.6		27 00.0 +60.0	125.0		27
28	31 51.0 +59.6	121.6		31 19.3 +59.7	122.2		30 47.1 +59.8	122.7		30 14.5 +59.9	123.2		29 41.5 +59.9	123.6		29 08.1 +59.9	124.1		28 34.2 +60.0	124.6		28 00.0 +60.0	125.0		28
29	32 50.6 +59.5	121.5		32 19.0 +59.7	122.0		31 46.9 +59.8	122.6		31 14.4 +59.9	123.1		30 41.4 +60.0	123.6		30 08.0 +60.0	124.1		29 34.2 +60.0	124.5		29 00.0 +60.0	125.0		29
30	33 50.1 +59.6	121.3		33 18.7 +59.6	121.9		32 46.7 +59.8	122.5		32 14.3 +59.8	123.0		31 41.4 +59.9	123.5		31 08.0 +60.0	124.0		30 34.2 +60.0	124.5		30 00.0 +60.0	125.0		30
31	34 49.7 +59.5	121.2		34 18.3 +59.7	121.8		33 46.5 +59.8	122.4		33 14.1 +59.9	122.9		32 41.3 +59.9	123.4		32 08.0 +59.9	124.0		31 34.2 +60.0	124.5		31 00.0 +60.0	125.0		31
32	35 49.2 +59.6	121.0		35 18.0 +59.7	121.7		34 46.3 +59.7	122.3		34 14.0 +59.8	122.8		33 41.2 +59.9	123.4		33 07.9 +60.0	123.9		32 34.2 +60.0	124.5		32 00.0 +60.0	125.0		32
33	36 48.8 +59.5	120.9		36 17.7 +59.6	121.5		35 46.0 +59.8	122.1		35 13.8 +59.9	122.7		34 41.1 +59.9	123.3		34 07.9 +60.0	123.9		33 34.2 +60.0	124.5		33 00.0 +60.0	125.0		33
34	37 48.3 +59.5	120.7		37 17.3 +59.8	121.4		36 45.8 +59.6	122.0		36 11.7 +59.8	121.5		35 40.0 +59.8	122.4		35 07.9 +59.9	123.9		34 34.1 +60.0	124.2		34 00.0 +60.0	125.0		34
35	38 47.8 +59.5	120.6		38 17.0 +59.6	121.3		37 45.5 +59.8	121.9		37 13.5 +59.9	122.6		36 41.0 +59.9	123.2		36 07.8 +60.0	123.8		35 34.2 +60.0	124.4		35 00.0 +60.0	125.0		35
36	39 47.3 +59.5	120.4		39 16.6 +59.6	121.1		38 45.3 +59.7	121.8		38 13.4 +59.8	122.5		37 40.9 +59.9	123.1		37 07.8 +59.9	123.8		36 34.2 +60.0	124.4		3			

**LATITUDE CONTRARY NAME TO DECLINATION**      **L.H.A. 55°, 305°**

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
	Hc	d	Z	Hc	d	Z																			
0	4 00.5 -59.7	124.8		3 26.2 -59.7	124.9		2 51.9 -59.8	124.9		2 17.6 -59.9	124.9		1 43.2 -59.9	125.0		1 08.8 -60.0	125.0		0 34.4 -60.0	125.0		0 00.0 +60.0	55.0		0
1	3 00.8 -59.7	124.9		2 26.5 -59.8	124.9		1 52.1 -59.9	125.0		1 17.7 -59.9	125.0		0 43.3 -60.0	125.0		0 08.8 -59.9	125.0		0 25.6 +60.0	55.0		1 00.0 +60.0	55.0		1
2	2 01.1 -59.7	125.0		1 26.7 -59.8	125.0		0 52.2 -59.8	125.0		0 17.8 -59.9	125.0		0 16.7 +59.9	55.0		0 51.1 +60.0	55.0		1 25.6 +60.0	55.0		2 00.0 +60.0	55.0		2
3	1 01.4 -59.7	125.1		0 26.9 -59.8	125.1		0 07.6 +59.9	54.9		0 42.1 +59.9	54.9		1 16.6 +60.0	54.9		1 51.1 +60.0	54.9		2 25.6 +60.0	55.0		3 00.0 +60.0	55.0		3
4	0 01.7 -59.7	125.2		0 32.9 +59.8	54.8		1 07.5 +59.8	54.8		1 42.0 +59.9	54.8		2 16.6 +59.9	54.9		2 51.1 +60.0	54.9		3 25.6 +60.0	54.9		4 00.0 +60.0	55.0		4
5	0 58.0 +59.7	54.7		1 32.7 +59.7	54.7		2 07.3 +59.9	54.7		2 41.9 +59.9	54.8		3 16.5 +60.0	54.8		3 51.1 +59.9	54.9		4 25.6 +59.9	54.9		5 00.0 +60.0	55.0		5
6	1 57.7 +59.7	54.6		2 32.4 +59.8	54.6		3 07.2 +59.8	54.7		3 41.8 +59.9	54.7		4 16.5 +59.9	54.8		4 51.0 +60.0	54.8		5 25.5 +60.0	54.9		6 00.0 +60.0	55.0		6
7	2 57.4 +59.7	54.5		3 32.2 +59.8	54.5		4 07.0 +59.8	54.6		4 41.7 +59.9	54.7		5 16.4 +59.9	54.7		5 51.0 +60.0	54.8		6 25.5 +60.0	54.9		7 00.0 +60.0	55.0		7
8	3 57.1 +59.7	54.4		4 32.0 +59.8	54.5		5 06.8 +59.9	54.5		5 41.6 +59.9	54.6		6 16.3 +60.0	54.7		6 51.0 +60.0	54.8		7 25.5 +60.0	54.9		8 00.0 +60.0	55.0		8
9	4 56.8 +59.7	54.3		5 31.8 +59.8	54.4		6 06.7 +59.8	54.5		6 41.5 +59.9	54.5		7 16.3 +59.9	54.6		7 51.0 +59.9	54.8		8 25.5 +60.0	54.9		9 00.0 +60.0	55.0		9
10	5 56.5 +59.7	54.2		6 31.6 +59.7	54.3		7 06.5 +59.9	54.4		7 41.4 +59.9	54.5		8 16.2 +60.0	54.6		8 50.9 +60.0	54.7		9 25.5 +60.0	54.9		10 00.0 +60.0	55.0		10
11	6 56.2 +59.7	54.1		7 31.3 +59.8	54.2		8 06.4 +59.8	54.3		8 41.3 +59.9	54.4		9 16.2 +59.9	54.6		9 50.9 +60.0	54.7		10 25.5 +60.0	54.8		11 00.0 +60.0	55.0		11
12	7 55.9 +59.7	54.0		8 31.1 +59.8	54.1		9 06.2 +59.9	54.2		9 41.2 +59.9	54.4		10 16.1 +60.0	54.5		10 50.9 +60.0	54.7		11 25.5 +60.0	54.8		12 00.0 +60.0	55.0		12
13	8 55.6 +59.7	53.9		9 30.9 +59.8	54.0		10 06.1 +59.8	54.2		10 41.1 +59.9	54.3		11 16.1 +59.9	54.5		11 50.9 +59.9	54.6		12 25.5 +60.0	54.8		13 00.0 +60.0	55.0		13
14	9 55.3 +59.7	53.8		10 30.7 +59.7	53.9		11 05.9 +59.8	54.1		11 41.0 +59.9	54.3		12 16.0 +59.9	54.4		12 50.8 +60.0	54.6		13 25.5 +60.0	54.8		14 00.0 +60.0	55.0		14
15	10 55.0 +59.7	53.7		11 30.4 +59.8	53.8		12 05.7 +59.9	54.0		12 40.9 +59.9	54.2		13 15.9 +60.0	54.4		13 50.8 +60.0	54.6		14 25.5 +60.0	54.8		15 00.0 +60.0	55.0		15
16	11 54.7 +59.6	53.6		12 30.2 +59.8	53.8		13 05.6 +59.8	53.9		13 40.8 +59.9	54.1		14 15.9 +59.9	54.3		14 50.8 +60.0	54.5		15 25.5 +60.0	54.8		16 00.0 +60.0	55.0		16
17	12 54.3 +59.7	53.5		13 30.0 +59.7	53.7		14 05.4 +59.9	53.9		14 40.7 +59.9	54.1		15 15.8 +60.0	54.3		15 50.8 +59.9	54.5		16 25.5 +60.0	54.8		17 00.0 +60.0	55.0		17
18	13 54.0 +59.7	53.4		14 29.7 +59.8	53.6		15 05.3 +59.8	53.8		15 40.6 +59.9	54.0		16 15.8 +59.9	54.2		16 50.7 +60.0	54.5		17 25.5 +60.0	54.7		18 00.0 +60.0	55.0		18
19	14 53.7 +59.7	53.3		15 29.5 +59.8	53.5		16 05.1 +59.8	53.7		16 40.5 +59.9	54.0		17 15.7 +59.9	54.2		17 50.7 +60.0	54.5		18 25.5 +60.0	54.7		19 00.0 +60.0	55.0		19
20	15 53.4 +59.7	53.2		16 29.3 +59.7	53.4		17 04.9 +59.9	53.6		17 40.4 +59.9	53.9		18 15.6 +60.0	54.2		18 50.7 +59.9	54.4		19 25.5 +60.0	54.7		20 00.0 +60.0	55.0		20
21	16 53.1 +59.6	53.1		17 29.0 +59.8	53.3		18 04.8 +59.8	53.6		18 40.3 +59.9	53.8		19 15.6 +59.9	54.1		19 50.6 +60.0	54.4		20 25.5 +59.9	54.7		21 00.0 +60.0	55.0		21
22	17 52.7 +59.7	52.9		18 28.8 +59.7	53.2		19 04.6 +59.8	53.5		19 40.2 +59.9	53.8		20 15.5 +60.0	54.1		20 50.6 +60.0	54.4		21 25.4 +60.0	54.7		22 00.0 +60.0	55.0		22
23	18 52.4 +59.7	52.8		19 28.5 +59.8	53.1		20 04.4 +59.8	53.4		20 40.1 +59.9	53.7		21 15.5 +59.9	54.0		21 50.6 +60.0	54.3		22 25.4 +60.0	54.7		23 00.0 +60.0	55.0		23
24	19 52.1 +59.6	52.7		20 28.3 +59.7	53.0		21 04.2 +59.9	53.3		21 40.0 +59.8	53.6		22 15.4 +59.9	54.0		22 50.6 +59.9	54.3		23 25.4 +60.0	54.6		24 00.0 +60.0	55.0		24
25	20 51.7 +59.7	52.6		21 28.0 +59.8	52.9		22 04.1 +59.8	53.2		22 39.8 +59.9	53.6		23 15.3 +60.0	53.9		23 50.5 +60.0	54.3		24 25.4 +60.0	54.6		25 00.0 +60.0	55.0		25
26	21 51.4 +59.6	52.5		22 27.8 +59.7	52.8		23 03.9 +59.8	53.2		23 39.7 +59.9	53.5		24 15.3 +59.9	53.9		24 50.5 +60.0	54.2		25 25.4 +60.0	54.6		26 00.0 +60.0	55.0		26
27	22 51.0 +59.7	52.4		23 27.5 +59.7	52.7		24 03.7 +59.8	53.1		24 39.6 +59.9	53.4		25 15.2 +59.9	53.8		25 50.5 +59.9	54.2		26 25.4 +60.0	54.6		27 00.0 +60.0	55.0		27
28	23 50.7 +59.6	52.3		24 27.2 +59.8	52.6		25 03.5 +59.8	53.0		25 39.5 +59.9	53.4		26 15.1 +60.0	53.8		26 50.4 +60.0	54.2		27 25.4 +60.0	54.6		28 00.0 +60.0	55.0		28
29	24 50.3 +59.6	52.1		25 27.0 +59.7	52.5		26 03.3 +59.8	52.9		26 39.4 +59.9	53.3		27 15.1 +59.9	53.7		27 50.4 +60.0	54.1		28 25.4 +60.0	54.6		29 00.0 +60.0	55.0		29
30	25 49.9 +59.7	52.0		26 26.7 +59.7	52.4		27 03.1 +59.8	52.8		27 39.2 +59.9	53.2		28 15.0 +59.9	53.6		28 50.4 +59.9	54.1		29 25.4 +60.0	54.5		30 00.0 +60.0	55.0		30
31	26 49.6 +59.6	51.9		27 26.4 +59.7	52.3		28 02.9 +59.8	52.7		28 39.1 +59.9	53.1		29 14.9 +59.9	53.6		29 50.3 +60.0	54.0		30 25.4 +60.0	54.5		31 00.0 +60.0	55.0		31
32	27 49.2 +59.6	51.8		28 26.1 +59.8	52.2		29 02.7 +59.8	52.6		29 39.0 +59.9	53.1		30 14.8 +60.0	53.5		30 50.3 +60.0	54.0		31 25.4 +60.0	54.5		32 00.0 +60.0	55.0		32
33	28 48.8 +59.6	51.6		29 25.9 +59.7	52.1		30 02.5 +59.8	52.5		30 38.9 +59.8	53.0		31 14.8 +59.9	53.5		31 50.3 +59.9	54.0		32 25.4 +60.0	54.5		33 00.0 +60.0	55.0		33
34	29 48.4 +59.6	51.5		30 25.6 +59.7	52.0		31 02.3 +59.8	52.4		31 38.7 +59.9	52.9		32 14.7 +59.9	53.4		32 50.2 +60.0	53.9		33 25.4 +59.9	54.5		34 00.0 +60.0	55.0		34
35	30 48.0 +59.6	51.4		31 25.3 +59.7	51.8		32 02.1 +59.8	52.3		32 38.6 +59.8	52.8		33 14.6 +59.9	53.4		33 50.2 +60.0	53.9		34 25.3 +60.0	54.4		35 00.0 +60.0	55.0		35
36	31 47.6 +59.6	51.2		32 25.0 +59.6	51.7		33 01.9 +59.8	52.2		33 38.4 +59.9	52.8		34 14.5 +60.0	53.3		34 50.2 +59.9	53.8		35 25.3 +60.0	54.4		36 00.0 +60.0	55.0		36
37	32 47.2 +59.5	51.1		33 24.6 +59.7	51.6		34 00.7 +59.8	52.1		34 38.3 +59.9	52.7		35 14.5 +59.9	53.2		35 50.1 +60.0	53.8		36 25.3 +60.0	54.4		37 00.0 +60.0	55.0		37
38	33 46.7 +59.5	51.0		34 24.3 +59.7	51.																				

56°, 304° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
Dec.	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Dec.
0	3 54.5 + 59.7	123.8	3 21.1 + 59.7	123.9	2 47.6 + 59.9	123.9	2 14.1 + 59.9	123.9	1 40.6 + 60.0	124.0	1 07.1 + 60.0	124.0	0 33.6 + 59.9	124.0	0 00.0 + 60.0	124.0	0 00.0 + 60.0	124.0	0 00.0 + 60.0	124.0	0 00.0 + 60.0	124.0	0 00.0 + 60.0	124.0	0
1	4 54.2 + 59.6	123.7	4 20.8 + 59.8	123.8	3 47.5 + 59.8	123.8	3 14.0 + 59.9	123.9	2 40.6 + 59.9	123.9	2 07.1 + 59.9	124.0	1 33.5 + 60.0	124.0	1 00.0 + 60.0	124.0	1 00.0 + 60.0	124.0	1 00.0 + 60.0	124.0	1 00.0 + 60.0	124.0	1 00.0 + 60.0	124.0	1
2	5 53.8 + 59.7	123.6	5 20.6 + 59.8	123.7	4 47.3 + 59.8	123.8	4 13.9 + 59.9	123.8	3 40.5 + 60.0	123.9	3 07.0 + 60.0	123.9	2 33.5 + 60.0	124.0	2 00.0 + 60.0	124.0	2 00.0 + 60.0	124.0	2 00.0 + 60.0	124.0	2 00.0 + 60.0	124.0	2 00.0 + 60.0	124.0	2
3	6 53.5 + 59.7	123.5	6 20.4 + 59.7	123.6	5 47.1 + 59.9	123.7	5 13.8 + 59.9	123.8	4 40.5 + 59.9	123.8	4 07.0 + 60.0	123.9	3 33.5 + 60.0	124.0	3 00.0 + 60.0	124.0	3 00.0 + 60.0	124.0	3 00.0 + 60.0	124.0	3 00.0 + 60.0	124.0	3 00.0 + 60.0	124.0	3
4	7 53.2 + 59.7	123.4	7 20.1 + 59.8	123.5	6 47.0 + 59.8	123.6	6 13.7 + 59.9	123.7	5 40.4 + 59.9	123.8	5 07.0 + 60.0	123.9	4 33.5 + 60.0	123.9	4 00.0 + 60.0	124.0	4 00.0 + 60.0	124.0	4 00.0 + 60.0	124.0	4 00.0 + 60.0	124.0	4 00.0 + 60.0	124.0	4
5	8 52.9 + 59.7	123.3	8 19.9 + 59.8	123.4	7 46.8 + 59.9	123.5	7 13.6 + 59.9	123.6	6 40.3 + 60.0	123.7	6 07.0 + 59.9	123.8	5 33.5 + 60.0	123.9	5 00.0 + 60.0	124.0	5 00.0 + 60.0	124.0	5 00.0 + 60.0	124.0	5 00.0 + 60.0	124.0	5 00.0 + 60.0	124.0	5
6	9 52.6 + 59.7	123.2	9 19.7 + 59.8	123.3	8 46.7 + 59.8	123.4	8 13.5 + 59.9	123.5	7 40.3 + 59.9	123.7	7 06.9 + 60.0	123.8	6 33.5 + 60.0	123.9	6 00.0 + 60.0	124.0	6 00.0 + 60.0	124.0	6 00.0 + 60.0	124.0	6 00.0 + 60.0	124.0	6 00.0 + 60.0	124.0	6
7	10 52.3 + 59.7	123.1	10 19.5 + 59.7	123.2	9 46.5 + 59.8	123.4	9 13.4 + 59.9	123.5	8 40.2 + 60.0	123.7	8 06.9 + 60.0	123.8	7 33.5 + 60.0	123.9	7 00.0 + 60.0	124.0	7 00.0 + 60.0	124.0	7 00.0 + 60.0	124.0	7 00.0 + 60.0	124.0	7 00.0 + 60.0	124.0	7
8	11 52.0 + 59.6	123.0	11 19.2 + 59.8	123.1	10 46.3 + 59.9	123.3	10 13.3 + 59.9	123.5	9 40.2 + 59.9	123.6	9 06.9 + 60.0	123.8	8 33.5 + 60.0	123.9	8 00.0 + 60.0	124.0	8 00.0 + 60.0	124.0	8 00.0 + 60.0	124.0	8 00.0 + 60.0	124.0	8 00.0 + 60.0	124.0	8
9	12 51.6 + 59.7	122.9	12 19.0 + 59.7	123.1	11 46.2 + 59.8	123.2	11 13.2 + 59.9	123.4	10 40.1 + 59.9	123.6	10 06.9 + 59.9	123.7	9 33.5 + 60.0	123.9	9 00.0 + 60.0	124.0	9 00.0 + 60.0	124.0	9 00.0 + 60.0	124.0	9 00.0 + 60.0	124.0	9 00.0 + 60.0	124.0	9
10	13 51.3 + 59.7	122.8	13 18.7 + 59.8	123.0	12 46.0 + 59.8	123.2	12 13.1 + 59.9	123.3	11 40.0 + 60.0	123.5	11 06.8 + 60.0	123.7	10 33.5 + 60.0	123.8	10 00.0 + 60.0	124.0	10 00.0 + 60.0	124.0	10 00.0 + 60.0	124.0	10 00.0 + 60.0	124.0	10 00.0 + 60.0	124.0	10
11	14 51.0 + 59.6	122.7	14 18.5 + 59.8	122.9	13 45.8 + 59.9	123.1	13 13.0 + 59.9	123.3	12 40.0 + 59.9	123.5	12 06.8 + 60.0	123.7	11 33.5 + 60.0	123.8	11 00.0 + 60.0	124.0	11 00.0 + 60.0	124.0	11 00.0 + 60.0	124.0	11 00.0 + 60.0	124.0	11 00.0 + 60.0	124.0	11
12	15 50.6 + 59.7	122.5	15 18.3 + 59.7	122.8	14 45.7 + 59.8	123.0	14 12.9 + 59.9	123.2	13 39.9 + 60.0	123.4	13 06.8 + 60.0	123.6	12 33.5 + 60.0	123.8	12 00.0 + 60.0	124.0	12 00.0 + 60.0	124.0	12 00.0 + 60.0	124.0	12 00.0 + 60.0	124.0	12 00.0 + 60.0	124.0	12
13	16 50.3 + 59.7	122.4	16 18.0 + 59.8	122.7	15 45.5 + 59.8	122.9	15 12.8 + 59.9	123.2	14 39.9 + 59.9	123.4	14 06.8 + 59.9	123.6	13 33.5 + 60.0	123.8	13 00.0 + 60.0	124.0	13 00.0 + 60.0	124.0	13 00.0 + 60.0	124.0	13 00.0 + 60.0	124.0	13 00.0 + 60.0	124.0	13
14	17 50.0 + 59.6	122.3	17 17.8 + 59.7	122.6	16 45.3 + 59.9	122.9	16 12.7 + 59.9	123.1	15 39.8 + 59.9	123.3	15 06.7 + 60.0	123.6	14 33.5 + 60.0	123.8	14 00.0 + 60.0	124.0	14 00.0 + 60.0	124.0	14 00.0 + 60.0	124.0	14 00.0 + 60.0	124.0	14 00.0 + 60.0	124.0	14
15	18 49.6 + 59.7	122.2	18 17.5 + 59.8	122.5	17 45.2 + 59.8	122.8	17 12.6 + 59.9	123.0	16 39.7 + 60.0	123.3	16 06.7 + 60.0	123.5	15 33.5 + 59.9	123.8	15 00.0 + 60.0	124.0	15 00.0 + 60.0	124.0	15 00.0 + 60.0	124.0	15 00.0 + 60.0	124.0	15 00.0 + 60.0	124.0	15
16	19 49.3 + 59.6	122.1	19 17.3 + 59.7	122.4	18 45.0 + 59.8	122.7	18 12.5 + 59.8	123.0	17 39.7 + 59.9	123.2	17 06.7 + 60.0	123.5	16 33.4 + 60.0	123.8	16 00.0 + 60.0	124.0	16 00.0 + 60.0	124.0	16 00.0 + 60.0	124.0	16 00.0 + 60.0	124.0	16 00.0 + 60.0	124.0	16
17	20 48.9 + 59.7	122.0	20 17.0 + 59.8	122.3	19 44.8 + 59.8	122.6	19 12.3 + 59.9	122.9	18 39.6 + 60.0	123.2	18 06.7 + 59.9	123.5	17 33.4 + 60.0	123.7	17 00.0 + 60.0	124.0	17 00.0 + 60.0	124.0	17 00.0 + 60.0	124.0	17 00.0 + 60.0	124.0	17 00.0 + 60.0	124.0	17
18	21 48.6 + 59.6	121.9	21 16.8 + 59.7	122.2	20 44.6 + 59.9	122.5	20 12.2 + 59.9	122.8	19 39.6 + 59.9	123.1	19 06.6 + 60.0	123.4	18 33.4 + 60.0	123.7	18 00.0 + 60.0	124.0	18 00.0 + 60.0	124.0	18 00.0 + 60.0	124.0	18 00.0 + 60.0	124.0	18 00.0 + 60.0	124.0	18
19	22 48.2 + 59.7	121.8	22 16.5 + 59.7	122.1	21 44.5 + 59.8	122.4	21 12.1 + 59.9	122.8	20 39.5 + 59.9	123.1	20 06.6 + 60.0	123.4	19 33.4 + 60.0	123.7	19 00.0 + 60.0	124.0	19 00.0 + 60.0	124.0	19 00.0 + 60.0	124.0	19 00.0 + 60.0	124.0	19 00.0 + 60.0	124.0	19
20	23 47.9 + 59.6	121.6	23 16.2 + 59.8	122.0	22 44.3 + 59.8	122.4	22 12.0 + 59.9	122.7	21 39.4 + 60.0	123.0	21 06.6 + 59.9	123.4	20 33.4 + 60.0	123.7	20 00.0 + 60.0	124.0	20 00.0 + 60.0	124.0	20 00.0 + 60.0	124.0	20 00.0 + 60.0	124.0	20 00.0 + 60.0	124.0	20
21	24 47.5 + 59.6	121.5	24 16.0 + 59.7	121.9	23 44.1 + 59.8	122.3	23 11.9 + 59.9	122.6	22 39.4 + 59.9	123.0	22 06.5 + 60.0	123.3	21 33.4 + 60.0	123.7	21 00.0 + 60.0	124.0	21 00.0 + 60.0	124.0	21 00.0 + 60.0	124.0	21 00.0 + 60.0	124.0	21 00.0 + 60.0	124.0	21
22	25 47.1 + 59.6	121.4	25 15.7 + 59.7	121.8	24 43.9 + 59.8	122.2	24 11.8 + 59.8	122.6	23 39.3 + 59.9	122.9	23 06.5 + 60.0	123.3	22 33.4 + 60.0	123.7	22 00.0 + 60.0	124.0	22 00.0 + 60.0	124.0	22 00.0 + 60.0	124.0	22 00.0 + 60.0	124.0	22 00.0 + 60.0	124.0	22
23	26 46.7 + 59.6	121.3	26 15.4 + 59.7	121.7	25 43.7 + 59.8	122.1	25 11.6 + 59.9	122.5	24 39.2 + 60.0	122.9	24 06.5 + 59.9	123.3	23 33.4 + 60.0	123.6	23 00.0 + 60.0	124.0	23 00.0 + 60.0	124.0	23 00.0 + 60.0	124.0	23 00.0 + 60.0	124.0	23 00.0 + 60.0	124.0	23
24	27 46.3 + 59.7	121.1	27 15.1 + 59.7	121.6	26 43.5 + 59.8	122.0	26 11.5 + 59.9	122.4	25 39.2 + 59.9	122.8	25 06.4 + 60.0	123.2	24 33.5 + 60.0	123.6	24 00.0 + 60.0	124.0	24 00.0 + 60.0	124.0	24 00.0 + 60.0	124.0	24 00.0 + 60.0	124.0	24 00.0 + 60.0	124.0	24
25	28 46.0 + 59.5	121.0	28 14.8 + 59.7	121.5	27 43.3 + 59.8	121.9	27 11.4 + 59.9	122.4	26 39.1 + 59.9	122.8	26 06.4 + 60.0	123.2	25 33.4 + 60.0	123.6	25 00.0 + 60.0	124.0	25 00.0 + 60.0	124.0	25 00.0 + 60.0	124.0	25 00.0 + 60.0	124.0	25 00.0 + 60.0	124.0	25
26	29 45.5 + 59.6	120.9	29 14.5 + 59.7	121.4	28 43.1 + 59.8	121.8	28 11.3 + 59.8	122.3	27 39.0 + 59.9	122.7	27 06.4 + 60.0	123.2	26 33.4 + 60.0	123.6	26 00.0 + 60.0	124.0	26 00.0 + 60.0	124.0	26 00.0 + 60.0	124.0	26 00.0 + 60.0	124.0	26 00.0 + 60.0	124.0	26
27	30 45.1 + 59.6	120.7	30 14.2 + 59.7	121.2	29 42.9 + 59.8	121.7	29 11.1 + 59.9	122.2	28 38.9 + 60.0	122.7	28 06.4 + 59.9	123.1	27 33.4 + 60.0	123.6	27 00.0 + 60.0	124.0	27 00.0 + 60.0	124.0	27 00.0 + 60.0	124.0</					

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $56^\circ$ ,  $304^\circ$

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	3 54.5 -59.7	123.8	3 21.1 -59.8	123.9	2 47.6 -59.8	123.9	2 14.1 -59.9	123.9	1 40.6 -59.9	124.0	1 07.1 -60.0	124.0	0 33.6 -60.0	124.0	0 00.0 +60.0	56.0	0 00.0 +60.0	56.0	0 00.0 +60.0	56.0	0 00.0 +60.0	56.0	0 00.0 +60.0	56.0	0
1	2 54.8 -59.7	123.9	2 21.3 -59.8	123.9	1 47.8 -59.9	124.0	1 14.2 -59.9	124.0	0 40.7 -60.0	124.0	0 07.1 -60.0	124.0	0 26.4 +60.0	56.0	1 00.0 +60.0	56.0	1 00.0 +60.0	56.0	1 00.0 +60.0	56.0	1 00.0 +60.0	56.0	1		
2	1 55.1 -59.7	124.0	1 21.5 -59.8	124.0	0 47.9 -59.8	124.0	0 14.3 -59.9	124.1	0 19.3 +59.9	55.9	0 52.9 +59.9	56.0	1 26.4 +60.0	56.0	2 00.0 +60.0	56.0	2 00.0 +60.0	56.0	2 00.0 +60.0	56.0	2 00.0 +60.0	56.0	2		
3	0 55.4 -59.7	124.1	0 21.7 -59.7	124.1	0 11.9 +59.9	55.9	0 45.6 +59.9	55.9	2 19.2 +59.9	55.9	2 52.8 +60.0	55.9	3 26.4 +60.0	55.9	4 00.0 +60.0	56.0	4 00.0 +60.0	56.0	4 00.0 +60.0	56.0	4 00.0 +60.0	56.0	4		
4	0 04.3 +59.7	55.8	0 38.0 +59.8	55.8	1 11.8 +59.8	55.8	1 45.5 +59.9	55.8	3 19.1 +59.9	55.8	3 52.8 +60.0	55.9	4 26.4 +60.0	55.9	5 00.0 +60.0	56.0	5 00.0 +60.0	56.0	5 00.0 +60.0	56.0	5 00.0 +60.0	56.0	5		
5	1 04.0 +59.7	55.7	1 37.8 +59.8	55.7	2 11.6 +59.8	55.7	2 45.4 +59.9	55.8	4 19.0 +60.0	55.8	4 52.8 +59.9	55.8	5 26.4 +60.0	55.9	6 00.0 +60.0	56.0	6 00.0 +60.0	56.0	6 00.0 +60.0	56.0	6 00.0 +60.0	56.0	6		
6	2 03.7 +59.7	55.6	2 37.6 +59.8	55.6	3 11.4 +59.8	55.7	3 45.3 +59.9	55.7	5 19.0 +59.9	55.7	5 52.7 +60.0	55.8	6 26.4 +60.0	55.9	7 00.0 +60.0	56.0	7 00.0 +60.0	56.0	7 00.0 +60.0	56.0	7 00.0 +60.0	56.0	7		
7	3 03.4 +59.7	55.5	3 37.4 +59.7	55.5	4 11.3 +59.8	55.6	4 45.2 +59.9	55.7	6 18.9 +60.0	55.7	6 52.7 +60.0	55.8	7 26.4 +60.0	55.9	8 00.0 +60.0	56.0	8 00.0 +60.0	56.0	8 00.0 +60.0	56.0	8 00.0 +60.0	56.0	8		
8	4 03.1 +59.7	55.4	4 37.1 +59.8	55.5	5 11.1 +59.9	55.5	5 45.1 +59.9	55.6	7 18.9 +59.9	55.6	7 52.7 +60.0	55.8	8 26.4 +60.0	55.9	9 00.0 +60.0	56.0	9 00.0 +60.0	56.0	9 00.0 +60.0	56.0	9 00.0 +60.0	56.0	9		
9	5 02.8 +59.7	55.3	5 36.9 +59.8	55.4	6 11.0 +59.8	55.4	6 45.0 +59.9	55.5	7 18.9 +59.9	55.6	7 52.7 +60.0	55.8	8 26.4 +60.0	55.9	9 00.0 +60.0	56.0	9 00.0 +60.0	56.0	9 00.0 +60.0	56.0	9 00.0 +60.0	56.0	9		
10	6 02.5 +59.7	55.2	6 36.7 +59.7	55.3	7 10.8 +59.9	55.4	7 44.9 +59.9	55.5	8 18.8 +60.0	55.6	8 52.7 +59.9	55.7	9 26.4 +60.0	55.9	10 00.0 +60.0	56.0	10 00.0 +60.0	56.0	10 00.0 +60.0	56.0	10 00.0 +60.0	56.0	10		
11	7 02.2 +59.6	55.1	7 36.4 +59.8	55.2	8 10.7 +59.8	55.3	8 44.8 +59.9	55.4	9 18.8 +59.9	55.6	9 52.6 +60.0	55.7	10 26.4 +60.0	55.8	11 00.0 +60.0	56.0	11 00.0 +60.0	56.0	11 00.0 +60.0	56.0	11 00.0 +60.0	56.0	11		
12	8 01.8 +59.7	55.0	8 36.2 +59.8	55.1	9 10.5 +59.8	55.2	9 44.7 +59.9	55.4	10 18.7 +59.9	55.5	10 52.6 +60.0	55.7	11 26.4 +60.0	55.8	12 00.0 +60.0	56.0	12 00.0 +60.0	56.0	12 00.0 +60.0	56.0	12 00.0 +60.0	56.0	12		
13	9 01.5 +59.7	54.9	9 36.0 +59.8	55.0	10 10.3 +59.9	55.2	10 44.6 +59.8	55.3	11 18.6 +60.0	55.5	11 52.6 +59.9	55.6	12 26.4 +60.0	55.8	13 00.0 +60.0	56.0	13 00.0 +60.0	56.0	13 00.0 +60.0	56.0	13 00.0 +60.0	56.0	13		
14	10 01.2 +59.7	54.8	10 35.8 +59.7	54.9	11 10.2 +59.8	55.1	11 44.4 +59.9	55.2	12 18.6 +59.9	55.4	12 52.5 +60.0	55.6	13 26.4 +60.0	55.8	14 00.0 +60.0	56.0	14 00.0 +60.0	56.0	14 00.0 +60.0	56.0	14 00.0 +60.0	56.0	14		
15	11 00.9 +59.7	54.7	11 35.5 +59.8	54.8	12 10.0 +59.8	55.0	12 44.3 +59.9	55.2	13 18.5 +60.0	55.4	13 52.5 +60.0	55.6	14 26.4 +59.9	55.8	15 00.0 +60.0	56.0	15 00.0 +60.0	56.0	15 00.0 +60.0	56.0	15 00.0 +60.0	56.0	15		
16	12 00.6 +59.6	54.6	12 35.3 +59.7	54.7	13 09.8 +59.9	54.9	13 44.2 +59.9	55.1	14 18.5 +59.9	55.3	14 52.6 +60.0	55.5	15 26.3 +60.0	55.8	16 00.0 +60.0	56.0	16 00.0 +60.0	56.0	16 00.0 +60.0	56.0	16 00.0 +60.0	56.0	16		
17	13 00.2 +59.7	54.5	13 35.0 +59.8	54.6	14 09.7 +59.8	54.9	14 44.1 +59.9	55.1	15 18.4 +59.9	55.3	15 52.5 +59.9	55.5	16 26.3 +60.0	55.8	17 00.0 +60.0	56.0	17 00.0 +60.0	56.0	17 00.0 +60.0	56.0	17 00.0 +60.0	56.0	17		
18	13 59.9 +59.7	54.4	14 34.8 +59.8	54.6	15 09.5 +59.8	54.8	15 44.0 +60.0	55.0	16 18.3 +60.0	55.2	16 52.4 +60.0	55.5	17 26.3 +60.0	55.7	18 00.0 +60.0	56.0	18 00.0 +60.0	56.0	18 00.0 +60.0	56.0	18 00.0 +60.0	56.0	18		
19	14 59.6 +59.7	54.2	15 34.6 +59.7	54.5	16 09.3 +59.9	54.7	16 43.9 +59.9	54.9	17 18.3 +59.9	55.2	17 52.4 +60.0	55.4	18 26.3 +60.0	55.7	19 00.0 +60.0	56.0	19 00.0 +60.0	56.0	19 00.0 +60.0	56.0	19 00.0 +60.0	56.0	19		
20	15 59.3 +59.6	54.1	16 34.3 +59.8	54.4	17 09.2 +59.8	54.6	17 43.8 +59.9	54.9	18 18.2 +59.9	55.1	18 52.4 +60.0	55.4	19 26.3 +60.0	55.7	20 00.0 +60.0	56.0	20 00.0 +60.0	56.0	20 00.0 +60.0	56.0	20 00.0 +60.0	56.0	20		
21	16 58.9 +59.7	54.0	17 34.1 +59.7	54.3	18 09.0 +59.8	54.5	18 43.7 +59.9	54.8	19 18.1 +60.0	55.1	19 52.4 +59.9	55.4	20 26.3 +60.0	55.7	21 00.0 +60.0	56.0	21 00.0 +60.0	56.0	21 00.0 +60.0	56.0	21 00.0 +60.0	56.0	21		
22	17 58.6 +59.7	53.9	18 33.8 +59.8	54.2	19 08.8 +59.8	54.5	19 43.6 +59.9	54.7	20 18.1 +59.9	55.0	20 52.3 +60.0	55.4	21 26.3 +60.0	55.7	22 00.0 +60.0	56.0	22 00.0 +60.0	56.0	22 00.0 +60.0	56.0	22 00.0 +60.0	56.0	22		
23	18 58.3 +59.6	53.8	19 33.6 +59.7	54.1	20 08.6 +59.9	54.4	20 43.5 +59.8	54.7	21 18.0 +60.0	55.0	21 52.3 +60.0	55.3	22 26.3 +60.0	55.7	23 00.0 +60.0	56.0	23 00.0 +60.0	56.0	23 00.0 +60.0	56.0	23 00.0 +60.0	56.0	23		
24	19 57.9 +59.7	53.7	20 33.3 +59.8	54.0	21 08.5 +59.8	54.3	21 43.3 +59.9	54.6	22 18.0 +59.9	54.9	22 52.3 +59.9	55.3	23 26.3 +60.0	55.6	24 00.0 +60.0	56.0	24 00.0 +60.0	56.0	24 00.0 +60.0	56.0	24 00.0 +60.0	56.0	24		
25	20 57.6 +59.6	53.6	21 33.1 +59.7	53.9	22 08.3 +59.8	54.2	22 43.2 +59.9	54.5	23 17.9 +59.9	54.9	23 52.2 +60.0	55.2	24 26.3 +60.0	55.6	25 00.0 +60.0	56.0	25 00.0 +60.0	56.0	25 00.0 +60.0	56.0	25 00.0 +60.0	56.0	25		
26	21 57.2 +59.6	53.5	22 32.8 +59.7	53.8	23 08.1 +59.8	54.1	23 43.1 +59.9	54.5	24 17.8 +60.0	54.8	24 52.2 +60.0	55.2	25 26.3 +60.0	55.6	26 00.0 +60.0	56.0	26 00.0 +60.0	56.0	26 00.0 +60.0	56.0	26 00.0 +60.0	56.0	26		
27	22 56.8 +59.7	53.3	23 32.5 +59.8	53.7	24 07.9 +59.8	54.0	24 43.0 +59.9	54.4	25 17.8 +59.9	54.8	25 52.2 +59.9	55.2	26 26.3 +60.0	55.6	27 00.0 +60.0	56.0	27 00.0 +60.0	56.0	27 00.0 +60.0	56.0	27 00.0 +60.0	56.0	27		
28	23 56.5 +59.6	53.2	24 32.3 +59.7	53.6	25 07.7 +59.8	54.0	25 42.9 +59.9	54.3	26 17.7 +59.9	54.7	26 52.1 +60.0	55.1	27 26.3 +60.0	55.6	28 00.0 +60.0	56.0	28 00.0 +60.0	56.0	28 00.0 +60.0	56.0	28 00.0 +60.0	56.0	28		
29	24 56.1 +59.5	52.5	30 30.5 +59.7	52.9	31 06.5 +59.8	53.4	31 42.1 +59.8	53.9	32 17.2 +59.9	54.3	33 51.9 +60.0	54.9	34 26.2 +60.0	55.4	35 00.0 +60.0	56.0	35 00.0 +60.0	56.0	35 00.0 +60.0	56.0	35 00.0 +60.0	56.0	34		
30	30 53.7 +59.6	52.3	31 30.2 +59.7	52.8	32 06.3 +59.8	53.3	32 41.9 +59.9	53.8	33 17.2 +59.9	54.3	33 51.9 +60.0	54.9	34 26.2 +60.0	55.4	35 00.0 +60.0	56.0	35 00.0 +60.0	56.0	35 00.0 +60.0	56.0	35 00.0 +60.0	56.0	35		
31	31 53.3 +59.6	52.2	32 29.9 +59.7	52.7	33 06.1 +59.7	53.2	33 41.8 +59.9	53.7	34 17.1 +59.9	54.3	34 51.9 +59.9	54.8	35 26.2 +60.0	55.4	36 00.0 +60.0	56.0	36 00.0 +60.0	56.0	36 00.0 +60.0	56.0	36 00.0 +60.0	56.0	36		
32	32 52.9 +59.5	52.0	33 29.6 +59.7	52.6	34 05.8 +59.8	53.1	34 41.7 +59.8</td																		

57°, 303° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.		
Dec.	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Dec.		
0	3 48.3 +59.7 122.8	3 15.8 +59.8 122.9	2 43.2 +59.9 122.9	2 10.6 +59.9 122.9	1 38.0 +59.9 123.0	1 05.3 +60.0 123.0	0 32.7 +60.0 123.0	0 00.0 +60.0 123.0	0	8 46.8 +59.7 122.3	8 14.7 +59.7 122.4	7 42.4 +59.9 122.5	7 10.1 +59.9 122.6	6 37.7 +60.0 122.7	6 05.2 +60.0 122.8	5 32.6 +60.0 122.9	5 00.0 +60.0 123.0	5	9 46.4 +59.7 122.2	9 14.4 +59.8 122.3	8 42.3 +59.8 122.5	8 10.0 +59.9 122.6	7 37.7 +59.9 122.7	7 05.2 +60.0 122.8	6 32.6 +60.0 122.9	6 00.0 +60.0 123.0	6
1	4 48.0 +59.7 122.7	4 15.6 +59.8 122.8	3 43.1 +59.8 122.8	3 10.5 +59.9 122.9	2 37.9 +60.0 122.9	2 05.3 +60.0 123.0	1 32.7 +60.0 123.0	1 00.0 +60.0 123.0	1	5 47.7 +59.7 122.6	5 15.4 +59.7 122.7	4 42.9 +59.9 122.8	4 10.4 +59.9 122.8	3 37.9 +59.9 122.9	3 05.3 +60.0 122.9	2 32.7 +60.0 123.0	2 00.0 +60.0 123.0	2									
2	6 47.4 +59.7 122.5	6 15.1 +59.8 122.6	5 42.8 +59.8 122.7	5 10.3 +59.9 122.8	4 37.8 +60.0 122.8	4 05.3 +59.9 122.9	3 32.7 +60.0 123.0	3 00.0 +60.0 123.0	3	7 47.1 +59.7 122.4	7 14.9 +59.8 122.5	6 42.6 +59.8 122.6	6 10.2 +59.9 122.7	5 37.8 +59.9 122.8	5 05.2 +60.0 122.9	4 32.7 +59.9 122.9	4 00.0 +60.0 123.0	4									
3	8 46.8 +59.7 122.3	8 14.7 +59.7 122.4	7 42.4 +59.9 122.5	7 10.1 +59.9 122.6	6 37.7 +60.0 122.7	6 05.2 +60.0 122.8	5 32.6 +60.0 122.9	5 00.0 +60.0 123.0	5	9 46.4 +59.7 122.2	9 14.4 +59.8 122.3	8 42.3 +59.8 122.5	8 10.0 +59.9 122.6	7 37.7 +59.9 122.7	7 05.2 +60.0 122.8	6 32.6 +60.0 122.9	6 00.0 +60.0 123.0	6									
4	10 46.1 +59.7 122.1	10 14.2 +59.7 122.2	9 42.1 +59.8 122.4	9 09.9 +59.9 122.5	8 37.6 +59.9 122.7	8 05.2 +59.9 122.8	7 32.6 +60.0 122.9	7 00.0 +60.0 123.0	7	11 45.8 +59.7 122.0	11 13.9 +59.8 122.1	10 41.9 +59.9 122.3	10 09.8 +59.9 122.5	9 37.5 +60.0 122.6	9 05.1 +60.0 122.7	8 32.6 +60.0 122.9	8 00.0 +60.0 123.0	8									
5	12 45.5 +59.8 121.9	12 13.7 +59.8 122.1	11 41.8 +59.8 122.2	11 09.7 +59.9 122.4	10 37.5 +59.9 122.6	10 05.1 +60.0 122.7	9 32.6 +60.0 122.9	9 00.0 +60.0 123.0	9	13 45.1 +59.7 121.8	13 13.5 +59.7 122.0	12 41.6 +59.8 122.2	12 09.6 +59.9 122.3	11 37.4 +60.0 122.5	11 05.1 +60.0 122.7	10 32.6 +60.0 122.8	10 00.0 +60.0 123.0	10									
6	14 44.8 +59.6 121.6	14 13.2 +59.8 121.9	13 41.4 +59.9 122.1	13 09.5 +59.9 122.3	12 37.4 +59.9 122.5	12 05.1 +59.9 122.7	11 32.6 +60.0 122.8	11 00.0 +60.0 123.0	11	15 44.4 +59.7 121.5	15 13.0 +59.7 121.8	14 41.3 +59.8 122.0	14 09.4 +59.9 122.2	13 37.3 +59.9 122.4	13 05.0 +60.0 122.6	12 32.6 +60.0 122.8	12 00.0 +60.0 123.0	12									
7	16 44.1 +59.7 121.4	16 12.7 +59.8 121.7	15 41.1 +59.8 121.9	15 09.3 +59.9 122.2	14 37.2 +60.0 122.4	14 05.0 +60.0 122.6	13 32.6 +60.0 122.8	13 00.0 +60.0 123.0	13	17 43.8 +59.6 121.3	17 12.5 +59.7 121.6	16 40.9 +59.8 121.8	16 09.2 +59.8 122.1	15 37.2 +59.9 122.3	15 05.0 +60.0 122.6	14 32.6 +60.0 122.8	14 00.0 +60.0 123.0	14									
8	18 43.4 +59.7 121.2	18 12.2 +59.7 121.5	17 40.7 +59.9 121.8	17 09.0 +59.9 122.0	16 37.1 +59.9 122.3	16 05.0 +59.9 122.5	15 32.6 +60.0 122.8	15 00.0 +60.0 123.0	15	19 43.1 +59.6 121.1	19 11.9 +59.8 121.4	18 40.6 +59.8 121.7	18 08.9 +59.9 122.0	17 37.0 +60.0 122.2	17 04.9 +60.0 122.5	16 32.6 +60.0 122.8	16 00.0 +60.0 123.0	16									
9	20 42.7 +59.6 121.0	20 11.7 +59.7 121.3	19 40.4 +59.8 121.6	19 08.8 +59.9 121.9	18 37.0 +59.9 122.2	18 04.9 +60.0 122.5	17 32.6 +60.0 122.7	17 00.0 +60.0 123.0	17	21 42.3 +59.7 120.9	21 11.4 +59.8 121.2	20 40.2 +59.8 121.5	20 08.7 +59.9 121.8	19 36.9 +60.0 122.1	19 04.9 +59.9 122.4	18 32.6 +59.9 122.7	18 00.0 +60.0 123.0	18									
10	22 42.0 +59.6 120.7	22 11.2 +59.7 121.1	21 40.0 +59.8 121.4	21 08.6 +59.9 121.8	20 36.9 +59.9 122.1	20 04.8 +60.0 122.4	19 32.5 +60.0 122.7	19 00.0 +60.0 123.0	19	23 41.6 +59.6 120.6	23 10.9 +59.7 121.0	22 39.8 +59.8 121.3	22 08.5 +59.8 121.7	21 36.8 +59.9 122.0	21 04.8 +60.0 122.4	20 32.5 +60.0 122.7	20 00.0 +60.0 123.0	20									
11	24 41.2 +59.6 120.5	24 10.6 +59.7 120.9	23 39.6 +59.8 121.3	23 08.3 +59.9 121.6	22 36.7 +59.9 122.0	22 04.8 +59.9 122.3	21 32.5 +60.0 122.7	21 00.0 +60.0 123.0	21	25 40.8 +59.7 120.4	25 10.3 +59.7 120.8	24 39.5 +59.8 121.2	24 08.2 +59.9 121.6	23 36.6 +60.0 121.9	23 04.7 +60.0 122.3	22 32.5 +60.0 122.7	22 00.0 +60.0 123.0	22									
12	26 40.5 +59.6 120.2	26 10.0 +59.8 120.7	25 39.3 +59.8 121.1	25 08.1 +59.9 121.5	24 36.6 +59.9 121.9	24 04.7 +60.0 122.3	23 32.5 +60.0 122.6	23 00.0 +60.0 123.0	23	27 40.1 +59.6 120.1	27 09.8 +59.7 120.6	26 39.1 +59.8 121.0	26 08.0 +59.8 121.4	25 36.5 +59.9 121.8	25 04.7 +60.0 122.2	24 32.5 +60.0 122.6	24 00.0 +60.0 123.0	24									
13	28 39.7 +59.5 120.0	28 09.5 +59.7 120.4	27 38.9 +59.7 120.9	27 07.8 +59.9 121.3	26 36.4 +60.0 121.8	26 04.7 +59.9 122.2	25 32.5 +60.0 122.6	25 00.0 +60.0 123.0	25	29 39.2 +59.6 119.8	29 09.2 +59.7 120.3	28 38.6 +59.8 120.8	28 07.7 +59.9 121.3	27 36.4 +59.9 121.7	27 04.6 +60.0 122.2	26 32.5 +60.0 122.6	26 00.0 +60.0 123.0	26									
14	30 38.8 +59.6 119.7	30 08.9 +59.6 120.2	29 38.4 +59.8 120.7	29 07.6 +59.8 121.2	28 36.3 +59.9 121.7	28 04.6 +60.0 122.1	27 32.5 +60.0 122.6	27 00.0 +60.0 123.0	27	31 38.4 +59.6 119.6	31 08.5 +59.7 120.1	30 38.2 +59.8 120.6	30 07.4 +59.9 121.1	29 36.2 +59.9 121.6	29 04.6 +59.9 122.1	28 32.5 +60.0 122.5	28 00.0 +60.0 123.0	28									
15	32 38.0 +59.5 119.4	32 08.2 +59.7 120.0	31 38.0 +59.8 120.5	31 07.3 +59.9 121.0	30 36.1 +60.0 121.5	30 04.5 +60.0 122.0	29 32.5 +60.0 122.5	29 00.0 +60.0 123.0	29	33 37.5 +59.5 119.3	33 07.9 +59.7 119.9	32 37.8 +59.7 120.4	32 07.2 +59.8 121.0	31 36.1 +59.9 121.5	31 04.5 +60.0 122.0	30 32.5 +60.0 122.5	30 00.0 +60.0 123.0	30									
16	34 37.0 +59.6 119.1	34 07.6 +59.6 119.7	33 37.5 +59.8 120.3	33 07.0 +59.9 120.9	32 36.0 +59.9 121.2	32 04.5 +59.9 121.4	31 32.5 +59.9 122.0	31 00.0 +60.0 123.0	31	35 36.6 +59.5 119.0	35 07.2 +59.7 119.6	34 37.3 +59.8 120.2	34 06.9 +59.8 120.8	33 35.9 +59.9 121.4	33 04.4 +60.0 121.9	32 32.4 +60.0 122.5	32 00.0 +60.0 123.0	32									
17	36 36.1 +59.5 118.8	36 06.9 +59.6 119.5	35 37.1 +59.7 120.1	35 06.7 +59.9 120.7	34 35.8 +59.9 121.3	34 04.4 +59.9 121.9	33 32.4 +60.0 122.4	33 00.0 +60.0 123.0	33	37 35.6 +59.5 118.7	37 06.5 +59.6 119.3	36 36.8 +59.8 120.0	36 06.6 +59.8 120.6	35 35.7 +59.9 121.2	35 04.3 +60.0 122.4	34 32.4 +60.0 122.0	34 00.0 +60.0 123.0	34									
18	38 35.1 +59.5 118.5	38 06.1 +59.7 119.2	37 36.6 +59.7 119.9	37 06.4 +59.8 120.5	36 35.6 +59.9 121.2	36 04.3 +60.0 121.8	35 32.4 +60.0 122.4	35 00.0 +60.0 123.0	35	39 34.6 +59.4 118.3	39 05.8 +59.6 119.0	38 36.3 +59.7 119.7	38 06.2 +59.9 120.4	37 35.5 +60.0 121.1	37 04.3 +59.9 121.7	36 32.4 +60.0 122.4	36 00.0 +60.0 123.0	36									
19	40 34.0 +59.5 118.1	40 05.4 +59.6 118.9	39 36.0 +59.8 119.6	39 06.1 +59.8 120.3	38 35.5 +59.9 121.0	38 04.2 +60.0 121.7	37 32.4 +60.0 122.4	37 00.0 +60.0 123.0	37	41 33.5 +59.4 118.0	41 05.0 +59.6 118.7	40 35.8 +59.7 119.5	40 05.9 +59.8 120.2	39 35.4 +59.9 121.0	39 04.2 +59.9 121.7	38 32.4 +60.0 122.3	38 00.0 +60.0 123.0	38									
20	42 32.9 +59.4 117.8	42 04.6 +59.5 118.6	41 35.5 +59.7 119.4	41 05.7 +59.8 120.1	40 35.3 +59.9 120.9	40 04.1 +60.0 122.6	39 32.4 +60.0 122.3	39 00.0 +60.0 123.0	39	43 32.3 +59.4 117.6	43 04.1 +59.6 118.4	42 35.2 +59.7 119.2	42 05.5 +59.8 120.0	41 35.2 +59.9 120.8	41 04.1 +59.9 121.6	40 32.4 +60.0 122.3	40 00.0 +60.0 123.0	40									
21	44 31.7 +59.4 117.4	44 03.7 +59.5 118.3	43 34.9 +59.7 119.1	43 05.3 +59.8 119.9	42 35.0 +59.9 120.7	42 04.0 +60.0 121.5	41 32.4 +60.0 122.3	41 00.0 +60.0 123.0	41	45 31.1 +59.3 117.2	45 03.2 +59.6 118.1	44 34.6 +59.7 119.0	44 05.1 +59.8 120.9	43 34.5 +59.9 121.4	43 02.3 +60.0 122.2	42 32.3 +60.0 122.0	42 00.0 +60.0 123.0	42									
22	46 30.4 +59.3 117.0	46 02.8 +59.5 117.9	45 34.3 +59.6 118.8	45 04.9 +59.8 119.7	44 34.8 +59.9 120.6	44 03.9 +60.0 121.4	43 32.3 +60.0 122.2	43 00.0 +60.0 123.0	43	47 29.7 +59.3 116.8	47 02.9 +59.5 117.7	46 33.9 +59.7 118.7	46 04.7 +59.8 119.6	45 34.7 +59.9 121.3	45 03.9 +59.9 122.1	44 32.3 +60.0 122.2	44 00.0 +60.0 123.0	44									
23	48 29.0 +59.3 116.5	48 01.8 +59.4 116.5	47 34.2 +59.4 116.5	47 04.5 +59.8 117.5	46 34.5 +59.9 120.3	46 03.8 +60.0 121.3	45 32.3 +60.0 122.1	45 00.0 +60.0 123.0	45	49 28.3 +59.2 116.3	49 01.2 +59.5 117.3	48 33.2 +59.6 118.3	48 04.3 +59.8 119.3	47 34.5 +59.8 120.3	47 03.8 +59.9 121.2	46 32.3 +60.0 122.1	46 00.0 +60.0 123.0	46									
24	50 27.5 +59.2 116.0	50 00.7 +59.4 117.1	49 28.2 +59.7 118.2	49 04.1 +59.7 119.2	48 34.3 +59.9 120.2	48 03.7 +60.0 121.1	47 32.3 +60.0 122.1	47 00.0 +60.0 123.0	47																		

**LATITUDE CONTRARY NAME TO DECLINATION**

**L.H.A. 57°, 303°**

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	3 48.3 -59.6	122.8	3 15.8 -59.8	122.9	2 43.2 -59.8	122.9	2 10.6 -59.9	122.9	1 38.0 -59.9	123.0	1 05.3 -59.9	123.0	0 32.7 -60.0	123.0	0 00.0 +60.0	57.0	0 00.0 +60.0	57.0	0 00.0 +60.0	57.0	0 00.0 +60.0	57.0	0 00.0 +60.0	57.0	0
1	2 48.7 -59.7	122.9	2 16.0 -59.7	122.9	1 43.4 -59.8	123.0	1 10.7 -59.9	123.0	0 38.1 -60.0	123.0	0 05.4 -60.0	123.0	0 27.3 +60.0	57.0	1 00.0 +60.0	57.0	2 00.0 +60.0	57.0	2 00.0 +60.0	57.0	2 00.0 +60.0	57.0	1		
2	1 49.0 -59.7	123.0	1 16.3 -59.8	123.0	0 43.6 -59.9	123.0	0 10.8 -59.9	123.1	0 21.9 +59.9	56.9	0 54.6 +60.0	57.0	1 21.8 +60.0	56.9	1 54.6 +59.9	56.9	2 27.3 +60.0	57.0	3 00.0 +60.0	57.0	3 00.0 +60.0	57.0	3		
3	0 49.3 -59.7	123.1	0 16.5 -59.8	123.1	0 16.3 +59.8	56.9	0 49.1 +59.9	56.9	2 21.8 +59.9	56.9	2 54.5 +60.0	56.9	3 27.3 +60.0	56.9	4 00.0 +60.0	57.0	4 00.0 +60.0	57.0	4 00.0 +60.0	57.0	4				
4	0 10.4 +59.7	56.8	0 43.3 +59.7	56.8	1 16.1 +59.9	56.8	1 49.0 +59.8	56.8	3 21.7 +59.9	56.8	3 54.5 +60.0	56.9	4 27.3 +60.0	56.9	5 00.0 +60.0	57.0	5 00.0 +60.0	57.0	5 00.0 +60.0	57.0	5				
5	1 10.1 +59.7	56.7	1 43.0 +59.8	56.7	2 16.0 +59.8	56.7	2 48.8 +59.9	56.8	4 21.6 +60.0	56.8	4 54.5 +60.0	56.9	5 27.3 +60.0	56.9	6 00.0 +60.0	57.0	6 00.0 +60.0	57.0	6 00.0 +60.0	57.0	6				
6	2 09.8 +59.7	56.6	2 42.8 +59.8	56.6	3 15.8 +59.8	56.7	3 48.7 +59.9	56.7	5 21.6 +59.9	56.7	5 54.5 +59.9	56.8	6 27.3 +60.0	56.9	7 00.0 +60.0	57.0	7 00.0 +60.0	57.0	7 00.0 +60.0	57.0	7				
7	3 09.5 +59.6	56.5	3 42.6 +59.7	56.5	4 15.6 +59.9	56.6	4 48.6 +59.9	56.7	6 21.5 +60.0	56.7	6 54.4 +60.0	56.8	7 27.3 +60.0	56.9	8 00.0 +60.0	57.0	8 00.0 +60.0	57.0	8 00.0 +60.0	57.0	8				
8	4 09.1 +59.7	56.4	4 42.3 +59.8	56.4	5 15.5 +59.8	56.5	5 48.5 +59.9	56.6	7 21.5 +59.9	56.6	7 54.4 +60.0	56.8	8 27.3 +60.0	56.9	9 00.0 +60.0	57.0	9 00.0 +60.0	57.0	9 00.0 +60.0	57.0	9				
9	5 08.8 +59.7	56.3	5 42.1 +59.8	56.4	6 15.3 +59.8	56.4	6 48.4 +59.9	56.5	7 21.5 +59.9	56.6	7 54.4 +60.0	56.8	8 27.3 +60.0	56.9	9 00.0 +60.0	57.0	9 00.0 +60.0	57.0	9 00.0 +60.0	57.0	9				
10	6 08.5 +59.7	56.2	6 41.9 +59.7	56.3	7 15.1 +59.9	56.4	7 48.3 +59.9	56.5	8 21.4 +60.0	56.6	8 54.4 +60.0	56.7	9 27.3 +60.0	56.9	10 00.0 +60.0	57.0	10 00.0 +60.0	57.0	10 00.0 +60.0	57.0	10				
11	7 08.2 +59.7	56.1	7 41.6 +59.8	56.2	8 15.0 +59.8	56.3	8 48.2 +59.9	56.4	9 21.4 +59.9	56.5	9 54.4 +59.9	56.7	10 27.3 +59.9	56.8	11 00.0 +60.0	57.0	11 00.0 +60.0	57.0	11 00.0 +60.0	57.0	11				
12	8 07.9 +59.6	56.0	8 41.4 +59.8	56.1	9 14.8 +59.8	56.2	9 48.1 +59.9	56.4	10 21.3 +59.9	56.5	10 54.3 +60.0	56.7	11 27.2 +60.0	56.8	12 00.0 +60.0	57.0	12 00.0 +60.0	57.0	12 00.0 +60.0	57.0	12				
13	9 07.5 +59.7	55.9	9 41.2 +59.7	56.0	10 14.6 +59.9	56.1	10 48.0 +59.9	56.3	11 21.2 +60.0	56.5	11 54.3 +60.0	56.6	12 27.2 +60.0	56.8	13 00.0 +60.0	57.0	13 00.0 +60.0	57.0	13 00.0 +60.0	57.0	13				
14	10 07.2 +59.7	55.8	10 40.9 +59.8	55.9	11 14.5 +59.8	56.1	11 47.9 +59.9	56.2	12 21.2 +59.9	56.4	12 54.3 +60.0	56.6	13 27.2 +60.0	56.8	14 00.0 +60.0	57.0	14 00.0 +60.0	57.0	14 00.0 +60.0	57.0	14				
15	11 06.9 +59.7	55.6	11 40.7 +59.7	55.8	12 14.3 +59.8	56.0	12 47.8 +59.9	56.2	13 21.1 +60.0	56.4	13 54.3 +59.9	56.6	14 27.2 +60.0	56.8	15 00.0 +60.0	57.0	15 00.0 +60.0	57.0	15 00.0 +60.0	57.0	15				
16	12 06.6 +59.6	55.5	12 40.4 +59.8	55.7	13 14.1 +59.9	55.9	13 47.7 +59.9	56.1	14 21.1 +59.9	56.3	14 54.2 +60.0	56.5	15 27.2 +60.0	56.8	16 00.0 +60.0	57.0	16 00.0 +60.0	57.0	16 00.0 +60.0	57.0	16				
17	13 06.2 +59.7	55.4	13 40.2 +59.7	55.6	14 14.0 +59.8	55.8	14 47.6 +59.9	56.0	15 21.0 +59.9	56.3	15 54.2 +60.0	56.5	16 27.2 +60.0	56.7	17 00.0 +60.0	57.0	17 00.0 +60.0	57.0	17 00.0 +60.0	57.0	17				
18	14 05.9 +59.7	55.3	14 39.9 +59.8	55.5	15 13.8 +59.8	55.8	15 47.5 +59.9	56.0	16 20.9 +60.0	56.2	16 54.2 +59.9	56.5	17 27.2 +60.0	56.7	18 00.0 +60.0	57.0	18 00.0 +60.0	57.0	18 00.0 +60.0	57.0	18				
19	15 05.6 +59.6	55.2	15 39.7 +59.7	55.4	16 13.6 +59.9	55.7	16 47.4 +59.8	55.9	17 20.9 +59.9	56.2	17 54.1 +60.0	56.4	18 27.2 +60.0	56.7	19 00.0 +60.0	57.0	19 00.0 +60.0	57.0	19 00.0 +60.0	57.0	19				
20	16 05.2 +59.7	55.1	16 39.4 +59.8	55.3	17 13.5 +59.8	55.6	17 47.2 +59.9	55.9	18 20.8 +59.9	56.1	18 54.1 +60.0	56.4	19 27.2 +60.0	56.7	20 00.0 +60.0	57.0	20 00.0 +60.0	57.0	20 00.0 +60.0	57.0	20				
21	17 04.9 +59.6	55.0	17 39.2 +59.7	55.3	18 13.3 +59.8	55.5	18 47.1 +59.9	55.8	19 20.7 +60.0	56.1	19 54.1 +60.0	56.4	20 27.2 +60.0	56.7	21 00.0 +60.0	57.0	21 00.0 +60.0	57.0	21 00.0 +60.0	57.0	21				
22	18 04.5 +59.7	54.9	18 38.9 +59.8	55.2	19 13.1 +59.8	55.4	19 47.0 +59.9	55.7	20 20.7 +59.9	56.0	20 54.1 +59.9	56.3	21 27.2 +60.0	56.7	22 00.0 +60.0	57.0	22 00.0 +60.0	57.0	22 00.0 +60.0	57.0	22				
23	19 04.2 +59.6	54.8	19 38.7 +59.7	55.1	20 12.9 +59.8	55.4	20 46.9 +59.9	55.7	21 20.6 +59.9	56.0	21 54.0 +60.0	56.3	22 27.2 +60.0	56.6	23 00.0 +60.0	57.0	23 00.0 +60.0	57.0	23 00.0 +60.0	57.0	23				
24	20 03.8 +59.7	54.7	20 38.4 +59.8	55.0	21 12.7 +59.9	55.3	21 46.8 +59.9	55.6	22 20.5 +60.0	55.9	22 54.0 +60.0	56.3	23 27.2 +60.0	56.6	24 00.0 +60.0	57.0	24 00.0 +60.0	57.0	24 00.0 +60.0	57.0	24				
25	21 03.5 +59.6	54.5	21 38.2 +59.7	54.9	22 12.6 +59.8	55.2	22 46.7 +59.9	55.5	23 20.5 +59.9	55.9	23 54.0 +59.9	56.2	24 27.2 +59.9	56.6	25 00.0 +60.0	57.0	25 00.0 +60.0	57.0	25 00.0 +60.0	57.0	25				
26	22 03.1 +59.6	54.4	22 37.9 +59.7	54.8	23 12.4 +59.8	55.1	23 46.5 +59.9	55.5	24 20.4 +59.9	55.8	24 53.9 +60.0	56.2	25 27.1 +60.0	56.6	26 00.0 +60.0	57.0	26 00.0 +60.0	57.0	26 00.0 +60.0	57.0	26				
27	23 02.7 +59.7	54.3	23 37.6 +59.7	54.6	24 12.2 +59.8	55.0	24 46.4 +59.9	55.4	25 20.3 +60.0	55.8	25 53.9 +60.0	56.2	26 27.1 +60.0	56.6	27 00.0 +60.0	57.0	27 00.0 +60.0	57.0	27 00.0 +60.0	57.0	27				
28	24 02.4 +59.6	54.2	24 37.3 +59.8	54.5	25 12.0 +59.8	54.9	25 46.3 +59.9	55.3	26 20.3 +59.9	55.7	26 53.9 +60.0	56.1	27 27.1 +60.0	56.6	28 00.0 +60.0	57.0	28 00.0 +60.0	57.0	28 00.0 +60.0	57.0	28				
29	25 02.0 +59.6	54.1	25 37.1 +59.7	54.4	26 11.8 +59.8	54.8	26 46.2 +59.8	55.2	27 20.2 +59.9	55.7	27 53.8 +60.0	56.1	28 27.1 +60.0	56.5	29 00.0 +60.0	57.0	29 00.0 +60.0	57.0	29 00.0 +60.0	57.0	29				
30	26 01.6 +59.6	53.9	26 36.8 +59.7	54.3	27 11.6 +59.8	54.7	27 46.0 +59.9	55.2	28 20.1 +59.9	55.6	28 53.8 +60.0	56.1	29 27.1 +60.0	56.5	30 00.0 +60.0	57.0	30 00.0 +60.0	57.0	30 00.0 +60.0	57.0	30				
31	27 01.2 +59.6	53.8	27 36.5 +59.7	54.2	28 11.4 +59.8	54.6	28 45.9 +59.9	55.1	29 20.0 +60.0	55.5	29 53.8 +59.9	56.5	30 27.1 +60.0	56.5	31 00.0 +60.0	57.0	31 00.0 +60.0	57.0	31 00.0 +60.0	57.0	31				
32	28 00.8 +59.6	53.7	28 36.2 +59.7	54.1	29 11.2 +59.8	54.6	29 45.8 +59.8	55.0	30 20.0 +59.9	55.5	30 53.7 +60.0	56.0	31 27.1 +60.0	56.5	32 00.0 +60.0	57.0	32 00.0 +60.0	57.0	32 00.0 +60.0	57.0	32				
33	29 00.4 +59.6	53.5	29 35.9 +59.7	54.0	30 11.0 +59.7	54.5	30 45.6 +59.9	54.9	31 19.9 +59.9	55.4	31 53.7 +60.0	55.9	32 27.1 +60.0	56.5	33 00.0 +60.0	57.0	33 00.0 +60.0	57.0	33 00.0 +60.0	57.0	33				
34	30 00.0 +59.6	53.4	30 35.6 +59.7	53.9	31 10.7 +59.8	54.4	31 45.5 +59.8	54.9	32 19.8 +59.9	55.4	32 53.7 +59.9	55.8	33 27.1 +60.0	56.4	34 00.0 +60.0	57.0	34 00.0 +60.0	57.0	34 00.0 +60.0	57.0	34				
35	30 59.6 +59																								

58°, 302° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.		
Dec.	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Dec.		
0	3 42.2 +59.6 121.8	3 10.5 +59.8 121.9	2 38.8 +59.9 121.9	2 07.1 +59.9 121.9	1 35.4 +59.9 122.0	1 03.6 +60.0 122.0	0 31.8 +60.0 122.0	0 00.0 +60.0 122.0	0	4 41.8 +59.7 121.7	4 10.3 +59.7 121.8	3 38.7 +59.8 121.8	3 07.0 +59.9 121.9	2 35.3 +59.9 121.9	2 03.6 +59.9 122.0	1 31.8 +60.0 122.0	1 00.0 +60.0 122.0	1	5 41.5 +59.7 121.6	5 10.0 +59.8 121.7	4 38.5 +59.8 121.8	4 06.9 +59.9 121.8	3 35.2 +60.0 121.9	3 03.5 +60.0 122.0	2 31.8 +60.0 122.0	2 00.0 +60.0 122.0	2
1	6 41.2 +59.7 121.5	6 09.8 +59.8 121.6	5 38.3 +59.9 121.7	5 06.8 +59.9 121.8	4 35.2 +59.9 121.8	4 03.5 +60.0 121.9	3 31.8 +60.0 122.0	3 00.0 +60.0 122.0	3	7 40.9 +59.6 121.4	7 09.6 +59.7 121.5	6 38.2 +59.8 121.6	6 06.7 +59.9 121.7	5 35.1 +60.0 121.8	5 03.5 +59.9 121.9	4 31.8 +60.0 121.9	4 00.0 +60.0 122.0	4	8 40.5 +59.7 121.3	8 09.3 +59.8 121.4	7 38.0 +59.8 121.5	7 06.6 +59.9 121.6	6 35.1 +59.9 121.7	6 03.4 +60.0 121.8	5 31.8 +60.0 121.9	5 00.0 +60.0 122.0	5
6	9 40.2 +59.7 121.2	9 09.1 +59.7 121.3	8 37.8 +59.8 121.5	8 06.5 +59.9 121.6	7 35.0 +59.9 121.7	7 03.4 +60.0 121.8	6 31.8 +59.9 121.9	6 00.0 +60.0 122.0	6	7 39.9 +59.6 121.1	10 08.8 +59.8 121.2	9 37.7 +59.8 121.4	9 06.4 +59.9 121.5	8 34.9 +60.0 121.7	8 03.4 +60.0 121.8	7 31.7 +60.0 121.9	7 00.0 +60.0 122.0	7	8 39.5 +59.7 121.0	11 08.6 +59.8 121.1	10 37.5 +59.8 121.3	10 06.3 +59.8 121.5	9 34.9 +59.9 121.6	9 03.4 +59.9 121.7	8 31.7 +60.0 121.9	8 00.0 +60.0 122.0	8
9	12 39.2 +59.7 120.9	12 08.4 +59.7 121.0	11 37.3 +59.9 121.2	11 06.1 +59.9 121.4	10 34.8 +60.0 121.6	10 03.3 +60.0 121.7	9 31.7 +60.0 121.9	9 00.0 +60.0 122.0	9	10 38.9 +59.6 120.7	13 08.1 +59.8 121.0	12 37.2 +59.8 121.1	12 06.0 +59.9 121.3	11 34.8 +59.9 121.5	11 03.3 +60.0 121.7	10 31.7 +60.0 121.8	10 00.0 +60.0 122.0	10	11 38.5 +59.7 120.6	14 07.9 +59.7 120.9	13 37.0 +59.8 121.1	13 05.9 +59.9 121.3	12 34.7 +59.9 121.5	12 03.3 +60.0 121.7	11 31.7 +60.0 121.8	11 00.0 +60.0 122.0	11
12	15 38.2 +59.6 120.5	15 07.6 +59.7 120.8	14 36.8 +59.8 121.0	14 05.8 +59.9 121.2	13 34.6 +60.0 121.4	13 03.3 +59.9 121.6	12 31.7 +60.0 121.8	12 00.0 +60.0 122.0	12	13 37.8 +59.7 120.4	16 07.3 +59.8 120.7	15 36.6 +59.9 120.9	15 05.7 +59.9 121.1	14 34.6 +59.9 121.4	14 03.2 +60.0 121.6	13 31.7 +60.0 121.8	13 00.0 +60.0 122.0	13	14 37.5 +59.6 120.3	17 07.1 +59.7 120.6	16 36.5 +59.8 120.8	16 05.6 +59.9 121.1	15 34.5 +59.9 121.3	15 03.2 +60.0 121.6	14 31.7 +60.0 121.8	14 00.0 +60.0 122.0	14
15	18 37.1 +59.7 120.2	18 06.8 +59.8 120.5	17 36.3 +59.8 120.8	17 05.5 +59.9 121.0	16 34.4 +60.0 121.3	16 03.2 +59.9 121.5	15 31.7 +60.0 121.8	15 00.0 +60.0 122.0	15	19 36.8 +59.6 120.1	19 06.6 +59.7 120.4	18 36.1 +59.8 120.7	18 05.4 +59.9 121.0	17 34.4 +59.9 121.2	17 03.1 +60.0 121.5	16 31.7 +60.0 121.8	16 00.0 +60.0 122.0	16	20 36.4 +59.6 120.0	20 06.3 +59.7 120.3	19 35.9 +59.8 120.6	19 05.2 +59.9 120.9	18 34.3 +59.9 121.2	18 03.1 +60.0 121.5	17 31.7 +60.0 121.7	17 00.0 +60.0 122.0	17
18	21 36.0 +59.7 119.8	21 06.0 +59.8 120.2	20 35.7 +59.8 120.5	20 05.1 +59.9 120.8	19 34.2 +60.0 121.1	19 03.1 +60.0 121.4	18 31.7 +60.0 121.7	18 00.0 +60.0 122.0	18	19 25.7 +59.6 119.7	22 05.8 +59.7 120.1	21 35.5 +59.8 120.4	21 05.0 +59.9 120.8	20 34.2 +59.9 121.1	20 03.1 +59.9 121.4	19 31.7 +60.0 121.7	19 00.0 +60.0 122.0	19	20 35.3 +59.6 119.6	23 05.5 +59.7 120.0	22 35.3 +59.8 120.3	22 04.9 +59.9 120.7	21 34.1 +59.9 121.0	21 03.0 +60.0 121.4	20 31.7 +59.9 121.7	20 00.0 +60.0 122.0	20
21	24 34.9 +59.6 119.5	24 05.2 +59.7 119.9	23 35.1 +59.8 120.2	23 04.8 +59.8 120.6	22 34.0 +60.0 121.0	22 03.0 +60.0 121.3	21 31.6 +60.0 121.7	21 00.0 +60.0 122.0	21	25 34.5 +59.6 119.3	25 04.9 +59.7 119.8	24 35.0 +59.8 120.2	24 04.6 +59.9 120.5	23 34.0 +59.9 120.9	23 03.0 +59.9 121.2	22 31.6 +60.0 121.7	22 00.0 +60.0 122.0	22	26 34.1 +59.6 119.2	26 04.6 +59.7 119.6	25 34.8 +59.7 120.1	25 04.5 +59.9 120.5	24 33.9 +59.9 120.9	24 02.9 +60.0 121.3	23 31.6 +60.0 121.6	23 00.0 +60.0 122.0	23
24	27 33.7 +59.6 119.1	27 04.3 +59.7 119.5	26 34.5 +59.8 120.0	26 04.4 +59.8 120.4	25 33.8 +59.9 120.8	25 03.8 +60.0 121.2	24 33.5 +59.9 120.9	24 02.9 +60.0 121.3	24	28 33.3 +59.6 119.0	28 04.0 +59.7 119.4	27 34.3 +59.8 119.9	27 04.2 +59.9 120.3	26 33.8 +59.9 120.8	26 02.9 +59.9 121.2	25 31.6 +60.0 121.6	25 00.0 +60.0 122.0	25	29 32.9 +59.5 118.8	29 03.7 +59.7 119.3	28 34.1 +59.8 119.8	28 04.1 +59.9 120.3	27 33.7 +59.9 120.7	27 02.8 +60.0 121.1	26 31.6 +60.0 121.6	26 00.0 +60.0 122.0	26
25	30 32.4 +59.6 118.7	30 03.4 +59.7 119.2	29 33.9 +59.8 119.7	29 04.0 +59.8 120.2	28 33.6 +59.9 120.6	28 02.8 +60.0 121.1	27 33.6 +59.9 120.6	27 02.8 +60.0 121.1	27	31 32.0 +59.5 118.5	31 03.1 +59.7 119.1	30 33.7 +59.8 119.6	30 03.8 +59.9 120.1	29 33.5 +59.9 120.6	29 02.8 +59.9 121.1	28 31.6 +60.0 121.5	28 00.0 +60.0 122.0	28	32 31.5 +59.6 118.4	32 02.8 +59.6 118.9	31 33.5 +59.7 119.5	31 03.7 +59.9 120.0	30 33.4 +60.0 120.5	30 02.7 +60.0 121.0	29 31.6 +60.0 121.5	29 00.0 +60.0 122.0	29
30	33 31.1 +59.5 118.2	33 02.4 +59.7 118.8	32 33.2 +59.8 119.4	32 03.6 +59.8 119.9	31 33.4 +59.9 120.5	31 02.7 +60.0 121.0	30 31.6 +60.0 121.5	30 00.0 +60.0 122.0	30	34 30.6 +59.5 118.1	34 02.1 +59.6 118.7	33 33.0 +59.8 119.3	33 03.4 +59.9 119.9	32 33.3 +59.9 120.4	32 02.7 +59.9 121.0	31 31.6 +60.0 121.5	31 00.0 +60.0 122.0	31	35 30.1 +59.6 117.9	35 01.7 +59.7 118.6	34 32.8 +59.7 119.2	34 03.3 +59.8 119.8	33 32.9 +59.9 120.3	33 02.6 +60.0 120.9	32 31.6 +60.0 121.5	32 00.0 +60.0 122.0	32
33	36 29.7 +59.4 117.8	36 01.4 +59.6 118.4	35 32.5 +59.8 119.1	35 03.1 +59.8 119.7	34 33.1 +59.9 120.3	34 02.6 +60.0 120.9	33 31.6 +60.0 121.6	33 00.0 +60.0 122.0	33	37 29.1 +59.5 117.6	37 01.0 +59.6 118.3	36 32.3 +59.7 119.0	36 02.9 +59.9 119.6	35 33.0 +59.9 120.5	35 02.6 +59.9 121.0	34 31.5 +60.0 121.4	34 00.0 +60.0 122.0	34	38 28.6 +59.5 117.5	38 00.6 +59.7 118.2	37 32.0 +59.8 118.8	37 02.8 +59.8 119.5	36 32.9 +59.9 120.1	36 02.5 +60.0 120.8	35 31.5 +60.0 121.4	35 00.0 +60.0 122.0	35
35	39 28.1 +59.4 117.3	39 00.3 +59.6 118.0	38 31.8 +59.7 118.7	38 02.6 +59.8 119.4	37 32.8 +59.9 120.1	37 02.5 +59.9 120.7	36 31.5 +60.0 121.4	36 00.0 +60.0 122.0	36	40 27.5 +59.5 117.1	39 59.9 +59.5 117.9	39 31.5 +59.7 118.6	39 02.4 +59.9 119.3	38 32.7 +59.9 120.2	38 02.4 +60.0 120.8	37 31.5 +60.0 121.4	37 00.0 +60.0 122.0	37	41 27.0 +59.4 116.9	40 59.4 +59.6 117.7	39 31.2 +59.8 118.5	39 02.3 +59.8 119.2	38 32.6 +59.9 120.3	38 02.4 +60.0 120.6	37 31.5 +60.0 121.3	37 00.0 +60.0 122.0	37
38	42 26.4 +59.4 116.7	41 59.0 +59.6 117.5	41 30.9 +59.7 118.3	41 02.1 +59.8 119.1	40 32.5 +59.9 120.6	40 02.3 +60.0 120.6	39 31.5 +60.0 121.3	39 00.0 +60.0 122.0	39	43 25.8 +59.4 116.5	42 58.6 +59.5 117.4	42 30.6 +59.7 118.2	42 01.9 +59.8 119.0	41 32.4 +59.9 119.8	41 02.3 +60.0 120.5	40 31.5 +60.0 121.3	40 00.0 +60.0 122.0	40	44 25.2 +59.3 116.3	43 58.1 +59.6 117.2	43 30.3 +59.7 118.1	43 01.7 +59.8 118.9	42 32.3 +59.9 119.7	42 02.3 +59.9 120.5	41 31.5 +60.0 121.3	41 00.0 +60.0 122.0	41
42	45 24.5 +59.4 116.1	44 57.7 +59.5 117.0	44 30.0 +59.7 117.9	44 01.5 +59.8 118.6	43 32.2 +59.9 119.6	43 02.2 +60.0 120.4	42 31.5 +59.9 121.2	42 00.0 +60.0 122.0	42	46 23.9 +59.3 115.9	45 57.2 +59.5 116.9	45 29.7 +59.6 117.8	45 01.3 +59.8 119.5	44 32.1 +59.9 119.5	44 02.2 +59.9 120.4	43 31.4 +60.0 121.2	43 00.0 +60.0 122.0	43	47 23.2 +59.3 115.7	46 56.7 +59.5 116.7	46 29.3 +59.7 117.6	46 01.1 +59.8 119.6	45 32.0 +59.9 120.4	45 02.1 +59.9 120.3	44 31.4 +60.0 121.2	44 00.0 +60.0 122.0	44
45	48 22.5 +59.2 115.5	47 56.2 +59.4 116.5	47 29.0 +59.6 117.5	47 00.9 +59.7 118.4	46 31.9 +59.8 118.2	46 02.0 +60.0 120.3	45 31.4 +60.0 121.1	45 00.0 +60.0 122.0	45	46 21.7 +59.2 115.2	48 55.6 +59.5 116.3	48 28.6 +59.6 117.3	48 00.6 +59.8 118.3	47 31.7 +59.9 119.3	47 02.0 +59.9 120.2	46 31.4 +60.0 121.1	46 00.0 +60.0 122.0	46	47 20.9 +59.2 115.0	49 55.1 +59.4 116.1	49 28.2 +59.6 117.1	49 00.4 +59.7 118.2	48 32.7 +59.9 119.2	48 02.4 +60.0 120.1	47 31.5 +60.0 121.4	47 00.0 +60.0 122.0	47
46	49 21.7 +59.2 115.2	48 55.6 +59.5 116.3	48 28.6 +59.6 117.3	48 00.6 +59.8 118.3	47 31.7 +59.9 119.3	47 02.5 +59.9 120.1	46 31.4 +60.0 121.4	46 00.0 +60.0 122.0	46	47 20.5 +59.5 117.1	49 59.9 +59.5 117.9	49 31.5 +59.7 118.6	49 02.4 +59.9 119.3	48 32.7 +59.9 120.3	48 02.4 +60.0 120.8	47 31.5 +60.0 121.4	47 00.0 +60.0 122.0	47	48 21.0 +59.4 117.7	49 51.0 +59.6 117.8	49 30.8 +59.6 119						

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $58^\circ$ ,  $302^\circ$

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	3 42.2 -59.7	121.8	3 10.5 -59.7	121.9	2 38.8 -59.8	121.9	2 07.1 -59.9	121.9	1 35.4 -60.0	122.0	1 03.6 -60.0	122.0	0 31.8 -60.0	122.0	0 00.0 +60.0	58.0	0 00.0 +60.0	58.0	0 00.0 +60.0	58.0	0 00.0 +60.0	58.0	0 00.0 +60.0	58.0	0
1	2 42.5 -59.7	121.9	2 10.8 -59.8	121.9	1 39.0 -59.8	122.0	1 07.2 -59.9	122.0	0 34.5 -59.9	122.0	0 03.6 -60.0	122.0	0 28.2 +60.0	58.0	1 00.0 +60.0	58.0	1 00.0 +60.0	58.0	1 00.0 +60.0	58.0	1 00.0 +60.0	58.0	1		
2	1 42.8 -59.7	122.0	1 11.0 -59.8	122.0	0 39.2 -59.9	122.0	0 07.3 -59.9	122.1	0 24.5 +60.0	57.9	0 56.4 +59.9	58.0	1 28.2 +60.0	58.0	2 00.0 +60.0	58.0	2 00.0 +60.0	58.0	2 00.0 +60.0	58.0	2 00.0 +60.0	58.0	2		
3	0 43.1 -59.6	122.1	0 11.2 -59.7	122.1	0 20.7 +59.8	57.9	0 52.6 +59.9	57.9	2 24.4 +59.9	57.9	2 56.3 +60.0	57.9	3 28.2 +60.0	57.9	4 00.0 +60.0	58.0	4 00.0 +60.0	58.0	4 00.0 +60.0	58.0	4 00.0 +60.0	58.0	4		
4	0 16.5 +59.7	57.8	0 48.5 +59.8	57.8	1 20.5 +59.8	57.8	1 52.5 +59.9	57.8	3 24.3 +60.0	57.8	3 56.3 +60.0	57.9	4 28.2 +60.0	57.9	5 00.0 +60.0	58.0	5 00.0 +60.0	58.0	5 00.0 +60.0	58.0	5 00.0 +60.0	58.0	5		
5	1 16.2 +59.7	57.7	1 48.3 +59.8	57.7	2 20.3 +59.9	57.7	2 52.4 +59.9	57.8	4 24.3 +59.9	57.8	4 56.3 +59.9	57.8	5 28.2 +60.0	57.9	6 00.0 +60.0	58.0	6 00.0 +60.0	58.0	6 00.0 +60.0	58.0	6 00.0 +60.0	58.0	6		
6	2 15.9 +59.7	57.6	2 48.1 +59.7	57.6	3 20.2 +59.8	57.7	3 52.3 +59.9	57.7	5 24.2 +60.0	57.7	5 56.2 +60.0	57.8	6 28.2 +60.0	57.9	7 00.0 +60.0	58.0	7 00.0 +60.0	58.0	7 00.0 +60.0	58.0	7 00.0 +60.0	58.0	7		
7	3 15.6 +59.7	57.5	3 47.8 +59.8	57.5	4 20.0 +59.9	57.6	4 52.2 +59.9	57.6	5 23.6 +60.0	57.3	5 56.1 +60.0	57.7	6 28.2 +60.0	57.9	8 00.0 +60.0	58.0	8 00.0 +60.0	58.0	8 00.0 +60.0	58.0	8 00.0 +60.0	58.0	8		
8	4 15.3 +59.6	57.4	4 47.6 +59.7	57.4	5 19.9 +59.8	57.5	5 52.1 +59.8	57.6	6 24.2 +59.9	57.7	6 56.2 +60.0	57.8	7 28.2 +59.9	57.9	8 00.0 +60.0	58.0	8 00.0 +60.0	58.0	8 00.0 +60.0	58.0	8 00.0 +60.0	58.0	9		
9	5 14.9 +59.7	57.3	5 47.3 +59.8	57.3	6 19.7 +59.8	57.4	6 51.9 +59.9	57.5	7 24.1 +60.0	57.6	7 56.2 +60.0	57.7	8 28.1 +60.0	57.9	9 00.0 +60.0	58.0	9 00.0 +60.0	58.0	9 00.0 +60.0	58.0	9 00.0 +60.0	58.0	9		
10	6 14.6 +59.7	57.2	6 47.1 +59.8	57.3	7 19.5 +59.9	57.4	7 51.8 +59.9	57.5	8 24.1 +59.9	57.6	8 56.2 +59.9	57.7	9 28.1 +60.0	57.9	10 00.0 +60.0	58.0	10 00.0 +60.0	58.0	10 00.0 +60.0	58.0	10 00.0 +60.0	58.0	10		
11	7 14.3 +59.7	57.1	7 46.9 +59.7	57.2	8 19.4 +59.8	57.3	8 51.7 +59.9	57.4	9 24.0 +59.9	57.5	9 56.1 +60.0	57.8	10 28.1 +60.0	57.8	11 00.0 +60.0	58.0	11 00.0 +60.0	58.0	11 00.0 +60.0	58.0	11 00.0 +60.0	58.0	11		
12	8 14.0 +59.6	56.9	8 46.6 +59.8	57.1	9 19.2 +59.8	57.2	9 51.6 +59.9	57.3	10 23.9 +60.0	57.5	10 56.1 +60.0	57.7	11 28.1 +60.0	57.8	12 00.0 +60.0	58.0	12 00.0 +60.0	58.0	12 00.0 +60.0	58.0	12 00.0 +60.0	58.0	12		
13	9 13.6 +59.7	56.8	9 46.4 +59.7	57.0	10 19.0 +59.8	57.1	10 51.5 +59.9	57.3	11 23.9 +59.9	57.5	11 56.1 +59.9	57.6	12 28.1 +60.0	57.8	13 00.0 +60.0	58.0	13 00.0 +60.0	58.0	13 00.0 +60.0	58.0	13 00.0 +60.0	58.0	13		
14	10 13.3 +59.7	56.7	10 46.1 +59.8	56.9	11 18.8 +59.9	57.1	11 51.4 +59.9	57.2	12 23.8 +59.9	57.4	12 56.0 +60.0	57.6	13 28.1 +60.0	57.8	14 00.0 +60.0	58.0	14 00.0 +60.0	58.0	14 00.0 +60.0	58.0	14 00.0 +60.0	58.0	14		
15	11 13.0 +59.6	56.6	11 45.9 +59.7	56.8	12 18.7 +59.8	57.0	12 51.3 +59.9	57.2	13 23.7 +60.0	57.4	13 56.0 +60.0	57.6	14 28.1 +60.0	57.8	15 00.0 +60.0	58.0	15 00.0 +60.0	58.0	15 00.0 +60.0	58.0	15 00.0 +60.0	58.0	15		
16	12 12.6 +59.7	56.5	12 45.6 +59.8	56.7	13 18.5 +59.8	56.9	13 51.2 +59.9	57.1	14 23.7 +59.9	57.3	14 56.0 +60.0	57.5	15 28.1 +60.0	57.8	16 00.0 +60.0	58.0	16 00.0 +60.0	58.0	16 00.0 +60.0	58.0	16 00.0 +60.0	58.0	16		
17	13 12.3 +59.7	56.4	13 45.4 +59.7	56.6	14 18.3 +59.8	56.8	14 51.1 +59.9	57.0	15 23.6 +60.0	57.3	15 56.0 +59.9	57.5	16 28.1 +60.0	57.7	17 00.0 +60.0	58.0	17 00.0 +60.0	58.0	17 00.0 +60.0	58.0	17 00.0 +60.0	58.0	17		
18	14 12.0 +59.6	56.3	14 45.1 +59.8	56.5	15 18.2 +59.8	56.7	15 51.0 +59.9	57.0	16 23.6 +59.9	57.2	16 55.9 +60.0	57.5	17 28.1 +60.0	57.7	18 00.0 +60.0	58.0	18 00.0 +60.0	58.0	18 00.0 +60.0	58.0	18 00.0 +60.0	58.0	18		
19	15 11.6 +59.7	56.2	15 44.9 +59.7	56.4	16 18.0 +59.8	56.7	16 50.8 +59.9	56.9	17 23.5 +59.9	57.2	17 55.9 +60.0	57.4	18 28.1 +60.0	57.7	19 00.0 +60.0	58.0	19 00.0 +60.0	58.0	19 00.0 +60.0	58.0	19 00.0 +60.0	58.0	19		
20	16 11.3 +59.6	56.1	16 44.6 +59.8	56.3	17 17.8 +59.8	56.6	17 50.7 +59.9	56.8	18 23.4 +60.0	57.1	18 55.9 +59.9	57.4	19 28.1 +60.0	57.7	20 00.0 +60.0	58.0	20 00.0 +60.0	58.0	20 00.0 +60.0	58.0	20 00.0 +60.0	58.0	20		
21	17 10.9 +59.7	56.0	17 44.4 +59.7	56.2	18 17.6 +59.8	56.5	18 50.6 +59.9	56.8	19 23.4 +59.9	57.1	19 55.8 +60.0	57.4	20 28.1 +60.0	57.7	21 00.0 +60.0	58.0	21 00.0 +60.0	58.0	21 00.0 +60.0	58.0	21 00.0 +60.0	58.0	21		
22	18 10.6 +59.6	55.9	18 44.1 +59.8	56.1	19 17.4 +59.8	56.4	19 50.5 +59.9	56.7	20 23.3 +59.9	57.0	20 55.8 +60.0	57.3	21 28.1 +59.9	57.7	22 00.0 +60.0	58.0	22 00.0 +60.0	58.0	22 00.0 +60.0	58.0	22 00.0 +60.0	58.0	22		
23	19 10.2 +59.6	55.7	19 43.9 +59.7	56.0	20 17.2 +59.9	56.3	20 50.4 +59.9	56.6	21 23.2 +60.0	57.0	21 55.8 +60.0	57.3	22 28.0 +60.0	57.6	23 00.0 +60.0	58.0	23 00.0 +60.0	58.0	23 00.0 +60.0	58.0	23 00.0 +60.0	58.0	23		
24	20 09.8 +59.7	55.6	20 43.6 +59.7	55.9	21 17.1 +59.8	56.2	21 50.3 +59.8	56.6	22 23.2 +59.9	56.9	22 55.8 +59.9	57.3	23 28.0 +60.0	57.6	24 00.0 +60.0	58.0	24 00.0 +60.0	58.0	24 00.0 +60.0	58.0	24 00.0 +60.0	58.0	24		
25	21 09.5 +59.6	55.5	21 43.3 +59.7	55.8	22 16.9 +59.8	56.2	22 50.1 +59.9	56.5	23 23.1 +59.9	56.9	23 55.7 +60.0	57.2	24 28.0 +60.0	57.6	25 00.0 +60.0	58.0	25 00.0 +60.0	58.0	25 00.0 +60.0	58.0	25 00.0 +60.0	58.0	25		
26	22 09.1 +59.6	55.4	22 43.0 +59.8	55.7	23 16.7 +59.8	56.1	23 50.0 +59.9	56.4	24 23.0 +59.9	56.8	24 55.7 +60.0	57.2	25 28.0 +60.0	57.6	26 00.0 +60.0	58.0	26 00.0 +60.0	58.0	26 00.0 +60.0	58.0	26 00.0 +60.0	58.0	26		
27	23 08.7 +59.6	55.3	23 42.8 +59.7	55.6	24 16.5 +59.8	56.0	24 49.9 +59.9	56.4	25 22.9 +60.0	56.8	25 55.7 +59.9	57.2	26 28.0 +60.0	57.6	27 00.0 +60.0	58.0	27 00.0 +60.0	58.0	27 00.0 +60.0	58.0	27 00.0 +60.0	58.0	27		
28	24 08.3 +59.6	55.2	24 42.5 +59.7	55.5	25 16.3 +59.8	55.9	25 49.8 +59.9	56.3	26 22.9 +59.9	56.7	26 55.6 +60.0	57.1	27 28.0 +60.0	57.6	28 00.0 +60.0	58.0	28 00.0 +60.0	58.0	28 00.0 +60.0	58.0	28 00.0 +60.0	58.0	28		
29	25 07.9 +59.7	55.0	25 40.7 +59.6	54.7	31 10.3 +59.7	54.7	32 14.8 +59.7	55.2	33 22.3 +59.9	56.3	33 55.4 +59.9	56.8	34 27.9 +60.0	57.4	35 00.0 +60.0	58.0	35 00.0 +60.0	58.0	35 00.0 +60.0	58.0	35 00.0 +60.0	58.0	35		
30	26 07.6 +59.5	54.9	31 40.3 +59.7	54.7	32 14.8 +59.8	55.7	33 22.3 +59.9	56.3	34 55.4 +59.9	56.8	33 55.4 +59.9	56.8	34 27.9 +60.0	57.4	36 00.0 +60.0	58.0	36 00.0 +60.0	58.0	36 00.0 +60.0	58.0	36 00.0 +60.0	58.0	36		
31	27 07.1 +59.6	54.8	32 38.2 +59.7	55.2	33 13.3 +59.7	55.7	34 22.8 +59.8	56.5	35 22.1 +60.0	56.2	35 55.3 +60.0	56.8	36 27.9 +60.0	57.4	37 00.0 +60.0	58.0	37 00.0 +60.0	58.0	37 00.0 +60.0	58.0	37 00.0 +60.0	58.0	37		
32	28 06.7 +59.6	54.6	32 38.1 +59.8	55.1	33 13.0 +59.8	55.5	34 22.1 +59.8</td																		

59°, 301° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.		
Dec.	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Dec.		
0	3 35.9 +59.7 120.8	3 05.2 +59.7 120.9	2 34.4 +59.8 120.9	2 03.5 +59.9 120.9	1 32.7 +59.9 121.0	1 01.8 +60.0 121.0	0 30.9 +60.0 121.0	0 00.0 +60.0 121.0	0	3 35.9 +59.7 120.7	4 04.9 +59.8 120.8	3 34.2 +59.8 120.8	3 03.4 +59.9 120.9	2 32.6 +60.0 120.9	2 01.8 +59.9 121.0	1 30.9 +60.0 121.0	1 00.0 +60.0 121.0	1	3 35.3 +59.6 120.6	5 04.7 +59.7 120.7	4 34.0 +59.9 120.8	4 03.3 +59.9 120.8	3 32.6 +59.9 120.9	3 01.7 +60.0 120.9	2 30.9 +60.0 121.0	2 00.0 +60.0 121.0	2
1	4 35.6 +59.7 120.7	4 04.9 +59.8 120.8	3 34.2 +59.8 120.8	3 03.4 +59.9 120.9	2 32.6 +60.0 120.9	2 01.8 +59.9 121.0	1 30.9 +60.0 121.0	1 00.0 +60.0 121.0	1	5 35.3 +59.6 120.5	6 04.4 +59.8 120.6	5 33.9 +59.8 120.7	5 03.2 +59.9 120.8	4 32.5 +59.9 120.8	4 01.7 +60.0 120.9	3 30.9 +60.0 121.0	3 00.0 +60.0 121.0	3									
2	7 34.6 +59.7 120.4	7 04.2 +59.7 120.5	6 33.7 +59.8 120.6	6 03.1 +59.9 120.7	5 32.4 +60.0 120.8	5 01.7 +60.0 120.9	4 30.9 +60.0 121.0	4 00.0 +60.0 121.0	4	8 34.3 +59.8 120.3	8 03.9 +59.8 120.4	7 33.5 +59.9 120.5	7 03.0 +59.9 120.6	6 32.4 +59.9 120.7	6 01.7 +59.9 120.8	5 30.9 +60.0 120.9	5 00.0 +60.0 121.0	5									
3	9 33.9 +59.7 120.2	9 03.7 +59.8 120.3	8 33.4 +59.8 120.5	8 02.9 +59.9 120.6	7 32.3 +59.9 120.7	7 01.6 +60.0 120.8	6 30.9 +60.0 120.9	6 00.0 +60.0 121.0	6	10 33.6 +59.6 120.1	10 03.5 +59.7 120.2	9 33.2 +59.8 120.4	9 02.8 +59.9 120.5	8 32.2 +60.0 120.6	8 01.6 +60.0 120.8	7 30.9 +59.9 120.9	7 00.0 +60.0 121.0	7									
4	11 33.2 +59.7 120.0	11 03.2 +59.7 120.1	10 33.0 +59.8 120.3	10 02.7 +59.9 120.5	9 32.2 +59.9 120.6	9 01.6 +60.0 120.7	8 30.8 +60.0 120.9	8 00.0 +60.0 121.0	8	12 32.9 +59.7 119.8	12 02.9 +59.8 120.0	11 32.8 +59.9 120.2	11 02.6 +59.8 120.4	10 32.1 +60.0 120.6	10 01.6 +59.9 120.7	9 30.8 +60.0 120.9	9 00.0 +60.0 121.0	9									
5	13 32.6 +59.6 119.7	13 02.7 +59.7 119.9	12 32.7 +59.8 120.1	12 02.4 +59.9 120.3	11 32.1 +59.9 120.5	11 01.5 +60.0 120.7	10 30.8 +60.0 120.8	10 00.0 +60.0 121.0	10	14 32.2 +59.7 119.6	14 02.4 +59.8 119.9	13 32.5 +59.8 120.1	13 02.3 +59.9 120.3	12 32.0 +59.9 120.5	12 01.5 +60.0 120.7	11 30.8 +60.0 120.8	11 00.0 +60.0 121.0	11									
6	15 31.9 +59.6 119.5	15 02.2 +59.7 119.8	14 32.3 +59.8 120.0	14 02.2 +59.9 120.2	13 31.9 +60.0 120.4	13 01.5 +59.9 120.6	12 30.8 +60.0 120.8	12 00.0 +60.0 121.0	12	16 31.5 +59.6 119.4	16 01.9 +59.8 119.7	15 32.1 +59.8 119.9	15 02.1 +59.9 120.1	14 31.9 +59.9 120.4	14 01.4 +60.0 120.6	13 30.8 +60.0 120.8	13 00.0 +60.0 121.0	13									
7	17 31.1 +59.7 119.3	17 01.7 +59.7 119.6	16 31.9 +59.8 119.8	16 02.0 +59.9 120.1	15 31.8 +59.9 120.3	15 01.4 +60.0 120.6	14 30.8 +60.0 120.8	14 00.0 +60.0 121.0	14	18 30.8 +59.6 119.2	18 01.4 +59.7 119.5	17 31.8 +59.8 119.7	17 01.9 +59.9 120.0	16 31.7 +60.0 120.3	16 01.4 +60.0 120.5	15 30.8 +60.0 120.8	15 00.0 +60.0 121.0	15									
8	19 30.4 +59.6 119.1	19 01.1 +59.8 119.4	18 31.6 +59.8 119.7	18 01.8 +59.8 119.9	17 31.7 +59.9 120.2	17 01.4 +59.9 120.5	16 30.8 +60.0 120.7	16 00.0 +60.0 121.0	16	20 30.0 +59.7 118.9	20 00.9 +59.7 119.3	19 31.4 +59.8 119.6	19 01.6 +59.9 119.9	18 31.6 +59.9 120.2	18 01.3 +60.0 120.5	17 30.8 +60.0 120.7	17 00.0 +60.0 121.0	17									
9	21 29.7 +59.6 118.8	21 00.6 +59.7 119.2	20 31.2 +59.8 119.5	20 01.5 +59.9 119.8	19 31.5 +60.0 120.1	19 01.3 +60.0 120.4	18 30.8 +60.0 120.7	18 00.0 +60.0 121.0	18	22 29.3 +59.6 118.7	22 00.3 +59.7 119.1	21 31.0 +59.8 119.4	21 01.4 +59.9 119.7	20 31.5 +59.9 120.1	20 01.3 +59.9 120.4	19 30.8 +60.0 120.7	19 00.0 +60.0 121.0	19									
10	23 28.9 +59.6 118.6	23 00.0 +59.7 119.0	22 30.8 +59.8 119.3	22 01.3 +59.8 119.7	21 31.4 +59.9 120.0	21 01.2 +60.0 120.4	20 30.8 +60.0 120.7	20 00.0 +60.0 121.0	20	24 28.5 +59.6 118.4	23 59.7 +59.7 118.8	23 30.6 +59.8 119.2	23 01.1 +59.9 119.6	22 31.3 +60.0 120.0	22 01.2 +60.0 120.3	21 30.8 +59.9 120.7	21 00.0 +60.0 121.0	21									
11	25 28.1 +59.6 118.3	24 59.4 +59.7 118.7	24 30.4 +59.8 119.1	24 01.0 +59.9 119.5	23 31.3 +59.9 119.9	23 01.2 +59.9 120.3	22 30.7 +60.0 120.6	22 00.0 +60.0 121.0	22	26 27.7 +59.6 118.2	25 59.1 +59.7 118.6	25 30.2 +59.8 119.0	25 00.9 +59.8 119.5	24 31.2 +59.9 119.9	24 01.1 +60.0 120.3	23 30.7 +60.0 120.6	23 00.0 +60.0 121.0	23									
12	27 27.3 +59.6 118.1	26 58.8 +59.7 118.5	26 30.0 +59.8 119.0	26 00.7 +59.9 119.4	25 31.1 +59.9 119.8	25 01.1 +60.0 120.2	24 30.7 +60.0 120.6	24 00.0 +60.0 121.0	24	28 26.9 +59.5 117.9	27 58.5 +59.7 118.4	27 29.8 +59.8 118.9	27 00.6 +59.9 119.3	26 31.0 +60.0 119.8	26 01.1 +59.9 120.2	25 30.7 +60.0 120.6	25 00.0 +60.0 121.0	25									
13	29 26.4 +59.6 117.8	28 58.2 +59.7 118.3	28 29.6 +59.8 118.7	28 00.5 +59.8 119.2	27 31.0 +59.9 119.7	27 01.0 +60.0 120.1	26 30.7 +60.0 120.6	26 00.0 +60.0 121.0	26	30 26.0 +59.5 117.7	29 57.9 +59.7 118.2	29 29.3 +59.8 118.7	29 00.3 +59.9 119.2	28 30.9 +59.9 119.6	28 01.0 +60.0 120.1	27 30.7 +60.0 120.6	27 00.0 +60.0 121.0	27									
14	31 25.5 +59.6 117.5	30 57.6 +59.6 118.0	30 29.1 +59.8 118.6	30 00.2 +59.9 119.1	29 30.8 +59.9 119.6	29 00.1 +59.9 119.9	28 30.8 +59.9 120.5	28 00.0 +60.0 121.0	28	32 25.1 +59.5 117.4	31 57.2 +59.7 117.9	31 28.9 +59.8 118.5	31 00.1 +59.8 119.0	30 30.7 +59.9 119.5	30 00.9 +60.0 120.0	29 30.7 +60.0 120.5	29 00.0 +60.0 121.0	29									
15	33 24.6 +59.5 117.2	32 56.9 +59.7 117.8	32 28.7 +59.7 118.4	31 59.9 +59.9 118.9	31 30.6 +60.0 119.5	31 00.9 +60.0 120.0	30 30.7 +60.0 120.5	30 00.0 +60.0 121.0	30	34 24.1 +59.6 117.1	33 56.6 +59.6 117.7	33 28.4 +59.8 118.3	32 59.8 +59.8 118.8	32 30.6 +59.9 119.4	32 00.9 +59.9 119.9	31 30.7 +60.0 120.5	31 00.0 +60.0 121.0	31									
16	35 23.7 +59.5 116.9	34 56.2 +59.6 117.5	34 28.2 +59.7 118.1	33 59.6 +59.8 118.7	33 30.5 +59.9 119.3	33 00.8 +60.0 119.9	32 30.7 +60.0 120.5	32 00.0 +60.0 121.0	32	36 23.2 +59.4 116.8	35 55.8 +59.7 117.4	35 27.9 +59.8 118.0	34 59.4 +59.9 118.7	34 30.4 +59.9 119.3	34 00.8 +59.9 119.9	33 30.6 +60.0 120.4	33 00.0 +60.0 121.0	33									
17	37 22.6 +59.5 116.6	36 55.5 +59.6 117.3	36 27.7 +59.7 117.9	35 59.3 +59.8 118.6	35 30.3 +59.9 119.2	35 00.7 +60.0 119.8	34 30.6 +60.0 120.4	34 00.0 +60.0 121.0	34	38 22.1 +59.5 116.4	37 55.1 +59.6 117.1	37 27.4 +59.7 117.8	36 59.1 +59.8 118.5	36 30.2 +59.9 119.1	36 00.7 +60.0 119.8	35 30.6 +60.0 120.4	35 00.0 +60.0 121.0	35									
18	39 21.6 +59.4 116.2	38 54.7 +59.6 117.0	38 27.1 +59.8 117.7	37 58.9 +59.9 118.4	37 30.1 +59.9 119.1	37 00.7 +59.9 119.7	36 30.6 +60.0 120.4	36 00.0 +60.0 121.0	36	40 21.0 +59.4 116.1	39 54.3 +59.6 116.8	39 26.9 +59.7 117.6	38 58.8 +59.8 118.3	38 30.0 +59.9 119.0	38 00.6 +60.0 119.7	37 30.6 +60.0 120.3	37 00.0 +60.0 121.0	37									
19	41 20.4 +59.4 115.9	40 53.9 +59.5 116.7	40 26.6 +59.7 117.4	39 58.6 +59.8 118.2	39 29.9 +59.9 118.9	39 00.6 +59.9 119.6	38 30.6 +60.0 120.3	38 00.0 +60.0 121.0	38	42 19.8 +59.4 115.7	41 53.4 +59.6 116.5	41 26.3 +59.7 117.3	40 58.4 +59.8 118.1	40 29.8 +59.9 118.8	40 00.5 +60.0 119.6	39 30.6 +60.0 120.3	39 00.0 +60.0 121.0	39									
20	43 19.2 +59.4 115.5	42 53.0 +59.5 116.3	42 26.0 +59.7 117.2	41 58.2 +59.8 118.0	41 29.7 +59.9 118.8	41 00.5 +59.9 119.5	40 30.6 +60.0 120.3	40 00.0 +60.0 121.0	40	44 18.6 +59.3 115.3	43 52.5 +59.6 116.2	43 25.7 +59.6 117.0	42 58.0 +59.8 117.9	42 29.6 +59.9 118.7	42 00.4 +60.0 119.5	41 30.6 +60.0 120.2	41 00.0 +60.0 121.0	41									
21	45 17.9 +59.4 115.1	44 52.1 +59.5 116.0	44 25.3 +59.7 116.9	43 57.8 +59.8 117.7	43 25.9 +59.9 118.6	43 00.4 +59.9 119.4	42 30.6 +60.0 120.4	42 00.0 +60.0 121.0	42	46 17.3 +59.3 114.9	45 51.6 +59.5 115.8	45 25.0 +59.7 116.7	44 57.6 +59.8 117.6	44 29.4 +59.8 118.5	44 00.3 +60.0 119.4	43 30.5 +60.0 120.2	43 00.0 +60.0 121.0	43									
22	47 16.6 +59.2 114.7	46 51.1 +59.4 115.6	46 24.7 +59.6 116.6	45 57.4 +59.8 117.4	45 27.9 +59.8 117.4	45 00.3 +59.9 119.3	44 30.5 +60.0 120.4	44 00.0 +60.0 121.0	44	48 15.8 +59.3 114.4	47 50.5 +59.5 115.4	47 24.3 +59.6 116.4	46 57.2 +59.7 117.4	46 29.1 +59.8 117.3	46 00.2 +60.0 119.2	45 30.5 +60.0 120.1	45 00.0 +60.0 121.0	45									
23	49 15.1 +59.2 114.2	48 50.0 +59.4 115.2	48 23.9 +59.6 116.3	47 56.9 +59.8 117.3	47 29.0 +59.9 118.2	47 00.2 +59.9 119.2	46 30.5 +60.0 120.1	46 00.0 +60.0 121.0	46	50 14.3 +59.2 113.9	49 49.4 +59.4 115.0	49 23.5 +59.6 116.1	48 56.7 +59.7 117.1	48 28.9 +59.8 118.1	48 00.1 +60.0 119.1	47 30.5 +60.0 120.1	47 00.0 +60.0 121.0	47									
24	51 13.5 +59.1 113.7	50 48.8 +59.4 114.8	50 23.1 +59.6 115.9	49 56.4 +59.8 117.0	49 28.7 +59.9 118.0	49 00.1 +59.9 119.0	48 30.6 +60.0 120.0	48 00.0 +60.0 121.0</																			

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $59^\circ$ , 301°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	3 35.9 -59.7	120.8	0	3 05.2 -59.8	120.9	0	2 34.4 -59.9	120.9	0	2 03.5 -59.9	120.9	0	1 32.7 -60.0	121.0	0	1 01.8 -60.0	121.0	0	0 30.9 -60.0	121.0	0	0 00.0 +60.0	59.0	0	
1	2 36.2 -59.6	120.9	0	2 05.4 -59.8	121.0	0	1 34.5 -59.8	121.0	0	1 03.6 -59.8	121.0	0	0 32.7 -59.9	121.0	0	0 01.8 -60.0	121.0	0	0 29.1 +60.0	59.0	1	1 00.0 +60.0	59.0	1	
2	1 36.6 -59.7	121.0	0	1 05.6 -59.7	121.0	0	0 34.7 -59.8	121.1	0	0 03.8 -59.9	121.1	0	0 27.2 +59.9	58.9	0	0 58.2 +59.9	59.0	1	1 29.1 +60.0	59.0	2	2 00.0 +60.0	59.0	2	
3	0 36.9 -59.7	121.1	0	0 05.9 -59.8	121.1	0	0 25.1 +59.9	58.9	0	0 56.1 +59.9	58.9	0	0 27.1 +59.9	58.9	0	1 58.1 +60.0	58.9	2	2 29.1 +60.0	59.0	3	3 00.0 +60.0	59.0	3	
4	0 22.8 +59.6	58.8	0	0 53.9 +59.7	58.8	0	1 25.0 +59.8	58.8	0	1 56.0 +59.9	58.8	0	2 27.1 +59.9	58.9	0	2 58.1 +60.0	58.9	3	3 29.1 +60.0	58.9	4	4 00.0 +60.0	59.0	4	
5	1 22.4 +59.7	58.7	1 53.6 +59.8	58.7	2 24.8 +59.8	58.7	2 55.9 +59.9	58.8	3 27.0 +60.0	58.8	3 58.1 +59.9	58.9	4 29.1 +60.0	58.9	5 00.0 +60.0	59.0	5 20.5 +60.0	58.8	6 00.0 +60.0	59.0	6 00.0 +60.0	59.0	6		
6	2 22.1 +59.7	58.6	2 53.4 +59.7	58.6	3 24.6 +59.8	58.6	3 55.8 +59.9	58.7	4 27.0 +59.9	58.8	4 58.0 +60.0	58.8	5 29.1 +59.9	58.9	6 00.0 +60.0	59.0	7 00.0 +60.0	59.0	7 00.0 +60.0	59.0	7				
7	3 21.8 +59.6	58.5	3 53.1 +59.8	58.5	4 24.5 +59.8	58.6	4 55.7 +59.9	58.6	5 26.9 +59.9	58.7	5 58.0 +60.0	58.8	6 29.1 +59.9	58.9	7 00.0 +60.0	59.0	8 00.0 +60.0	59.0	8 00.0 +60.0	59.0	8				
8	4 21.4 +59.7	58.4	4 52.9 +59.8	58.4	5 24.3 +59.8	58.5	5 55.6 +59.9	58.6	6 26.8 +60.0	58.7	6 58.0 +60.0	58.8	7 29.0 +60.0	58.9	8 00.0 +60.0	59.0	9 00.0 +60.0	59.0	9 00.0 +60.0	59.0	9				
9	5 21.1 +59.7	58.2	5 52.7 +59.7	58.3	6 24.1 +59.8	58.4	6 55.5 +59.9	58.5	7 26.8 +59.9	58.6	7 58.0 +59.9	58.7	8 29.0 +60.0	58.9	9 00.0 +60.0	59.0	10 00.0 +60.0	59.0	10 00.0 +60.0	59.0	10				
10	6 20.8 +59.7	58.1	6 52.4 +59.8	58.2	7 23.9 +59.9	58.3	7 55.4 +59.9	58.5	8 26.7 +60.0	58.6	8 57.9 +60.0	58.7	9 29.0 +60.0	58.9	10 00.0 +60.0	59.0	11 00.0 +60.0	59.0	11 00.0 +60.0	59.0	11				
11	7 20.5 +59.6	58.0	7 52.2 +59.7	58.1	8 23.8 +59.8	58.3	8 55.3 +59.9	58.4	9 26.7 +59.9	58.5	9 57.9 +60.0	58.7	10 29.0 +60.0	58.8	11 00.0 +60.0	59.0	12 00.0 +60.0	59.0	12 00.0 +60.0	59.0	12				
12	8 20.1 +59.7	57.9	8 51.9 +59.8	58.1	9 23.6 +59.8	58.2	9 55.2 +59.9	58.3	10 26.6 +59.9	58.5	10 57.9 +60.0	58.7	11 29.0 +60.0	58.8	12 00.0 +60.0	59.0	13 00.0 +60.0	59.0	13 00.0 +60.0	59.0	13				
13	9 19.8 +59.6	57.8	9 51.7 +59.7	58.0	10 23.4 +59.9	58.1	10 55.1 +59.8	58.3	11 26.5 +60.0	58.4	11 57.9 +59.9	58.6	12 29.0 +60.0	58.8	13 00.0 +60.0	59.0	14 00.0 +60.0	59.0	14 00.0 +60.0	59.0	14				
14	10 19.4 +59.7	57.7	10 51.4 +59.8	57.9	11 23.3 +59.8	58.0	11 54.9 +59.9	58.2	12 26.5 +59.9	58.4	12 57.8 +60.0	58.6	13 29.0 +60.0	58.8	14 00.0 +60.0	59.0	15 00.0 +60.0	59.0	15 00.0 +60.0	59.0	15				
15	11 19.1 +59.7	57.6	11 51.2 +59.7	57.8	12 23.1 +59.8	58.0	12 54.8 +59.9	58.2	13 26.4 +59.9	58.4	13 57.8 +60.0	58.6	14 29.0 +60.0	58.8	15 00.0 +60.0	59.0	16 00.0 +60.0	59.0	16 00.0 +60.0	59.0	16				
16	12 18.8 +59.6	57.5	12 50.9 +59.8	57.7	13 22.9 +59.8	57.9	13 54.7 +59.9	58.1	14 26.3 +60.0	58.3	14 57.8 +59.9	58.5	15 29.0 +60.0	58.8	16 00.0 +60.0	59.0	17 00.0 +60.0	59.0	17 00.0 +60.0	59.0	17				
17	13 18.4 +59.7	57.4	13 50.7 +59.7	57.6	14 22.7 +59.8	57.8	14 54.6 +59.9	58.0	15 26.3 +59.9	58.3	15 57.7 +60.0	58.5	16 29.0 +60.0	58.7	17 00.0 +60.0	59.0	18 00.0 +60.0	59.0	18 00.0 +60.0	59.0	18				
18	14 18.1 +59.6	57.3	14 50.4 +59.7	57.5	15 22.6 +59.8	57.7	15 54.5 +59.9	58.0	16 26.2 +59.9	58.2	16 57.7 +60.0	58.5	17 29.0 +60.0	58.7	18 00.0 +60.0	59.0	19 00.0 +60.0	59.0	19 00.0 +60.0	59.0	19				
19	15 17.7 +59.7	57.2	15 50.1 +59.8	57.4	16 22.4 +59.8	57.6	16 54.4 +59.9	57.9	17 26.1 +60.0	58.2	17 57.7 +59.9	58.4	18 29.0 +60.0	58.7	19 00.0 +60.0	59.0	20 00.0 +60.0	59.0	20 00.0 +60.0	59.0	20				
20	16 17.4 +59.6	57.1	16 49.9 +59.7	57.3	17 22.2 +59.8	57.6	17 54.3 +59.8	57.8	18 26.1 +59.9	58.1	18 57.6 +60.0	58.4	19 29.0 +60.0	58.7	20 00.0 +60.0	59.0	21 00.0 +60.0	59.0	21 00.0 +60.0	59.0	21				
21	17 17.0 +59.6	56.9	17 49.6 +59.8	57.2	18 22.0 +59.8	57.5	18 54.1 +59.9	57.8	19 26.0 +59.9	58.1	19 57.6 +60.0	58.4	20 29.0 +60.0	58.7	21 00.0 +60.0	59.0	22 00.0 +60.0	59.0	22 00.0 +60.0	59.0	22				
22	18 16.6 +59.7	56.8	18 49.4 +59.7	57.1	19 21.8 +59.8	57.4	19 54.0 +59.9	57.7	20 25.9 +60.0	58.0	20 57.6 +60.0	58.3	21 28.9 +60.0	58.7	22 00.0 +60.0	59.0	23 00.0 +60.0	59.0	23 00.0 +60.0	59.0	23				
23	19 16.3 +59.6	56.7	19 49.1 +59.7	57.0	20 21.6 +59.8	57.3	20 53.9 +59.9	57.6	21 25.9 +59.9	58.0	21 57.6 +59.9	58.3	22 28.9 +60.0	58.6	23 00.0 +60.0	59.0	24 00.0 +60.0	59.0	24 00.0 +60.0	59.0	24				
24	20 15.9 +59.6	56.6	20 48.8 +59.7	56.9	21 21.4 +59.8	57.2	21 53.8 +59.8	57.6	22 25.8 +59.9	57.9	22 57.5 +60.0	58.3	23 28.9 +60.0	58.6	24 00.0 +60.0	59.0	25 00.0 +60.0	59.0	25 00.0 +60.0	59.0	25				
25	21 15.5 +59.6	56.5	21 48.5 +59.7	56.8	22 21.2 +59.8	57.1	22 53.6 +59.9	57.5	23 25.7 +60.0	57.9	23 57.5 +60.0	58.2	24 28.9 +60.0	58.6	25 00.0 +60.0	59.0	26 00.0 +60.0	59.0	26 00.0 +60.0	59.0	26				
26	22 15.1 +59.7	56.3	22 48.2 +59.8	56.7	23 21.0 +59.8	57.1	23 53.5 +59.9	57.4	24 25.7 +59.9	57.8	24 57.5 +59.9	58.2	25 28.9 +60.0	58.6	26 00.0 +60.0	59.0	27 00.0 +60.0	59.0	27 00.0 +60.0	59.0	27				
27	23 14.8 +59.6	56.2	23 48.0 +59.7	56.6	24 20.8 +59.8	57.0	24 53.4 +59.9	57.3	25 25.6 +59.9	57.7	25 57.4 +60.0	58.1	26 28.9 +60.0	58.6	27 00.0 +60.0	59.0	28 00.0 +60.0	59.0	28 00.0 +60.0	59.0	28				
28	24 14.4 +59.6	56.1	24 47.7 +59.7	56.5	25 20.6 +59.8	56.9	25 53.3 +59.9	57.3	26 25.5 +59.9	57.7	26 57.4 +60.0	58.1	27 28.9 +60.0	58.6	28 00.0 +60.0	59.0	29 00.0 +60.0	59.0	29 00.0 +60.0	59.0	29				
29	25 14.0 +59.6	56.0	25 47.4 +59.7	56.4	26 20.4 +59.8	56.8	26 53.1 +59.9	57.2	27 25.4 +60.0	57.6	27 57.4 +59.9	58.1	28 28.9 +60.0	58.5	29 00.0 +60.0	59.0	30 00.0 +60.0	59.0	30 00.0 +60.0	59.0	30				
30	26 13.6 +59.6	55.8	26 47.1 +59.7	56.3	27 20.2 +59.8	56.7	27 53.0 +59.8	57.1	28 25.4 +59.9	57.6	28 57.3 +60.0	58.0	29 28.9 +60.0	58.5	30 00.0 +60.0	59.0	31 00.0 +60.0	59.0	31 00.0 +60.0	59.0	31				
31	31 11.4 +59.6	55.2	31 45.5 +59.6	55.7	32 19.1 +59.8	56.2	32 52.2 +59.8	56.7	33 24.9 +60.0	57.3	33 57.1 +60.0	57.8	34 28.8 +60.0	58.4	35 00.0 +60.0	59.0	35 00.0 +60.0	59.0	35 00.0 +60.0	59.0	35				
32	32 11.0 +59.5	55.0	32 45.1 +59.7	55.5	33 18.9 +59.7	56.1	33 52.1 +59.8	56.6	34 24.9 +59.9	57.2	34 57.1 +60.0	57.8	35 28.8 +60.0	58.4	36 00.0 +60.0	59.0	36 00.0 +60.0	59.0	36 00.0 +60.0	59.0	36				
33	33 10.5 +59.5	54.9	33 44.8 +59.7	55.4	34 18.6 +59.8	56.0	34 51.9 +59.9	56.5	35 24.8 +59.9	57.1	35 57.1 +59.9	57.7	36 28.8 +60.0	58.4	37 00.0 +60.0	59.0	37 00.0 +60.0	59.0	37 00.0 +60.0	59.0	37				
34	34 10.0 +59.6	54.7	34 44.5 +59.6	55.3	35 18.4 +59.7	55.9	35 51.8 +59.8	56.5	36 24.7 +59.9	57.1	36 57.0 +60.0	57.7	37 28.8 +60.0	58.3	38 00.0 +60.0	59.0	38 00.0 +60.0	59.0	38 00.0 +60.0	59.0	38				
35	35 09.6 +59.5	54.6	35 44.1 +59.6	55.1	36 18.1 +59.8	55.7	36 51.6 +59.9	56.4	37 24.6 +59.9	5															

60°, 300° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
Dec.	Hc	d	Z	Dec.																					
0	3 29.6	+ 59.7	119.8	2 59.8	+ 59.7	119.9	2 29.9	+ 59.8	119.9	1 59.9	+ 59.9	119.9	1 30.0	+ 59.9	120.0	1 00.0	+ 60.0	120.0	0 30.0	+ 60.0	120.0	0 00.0	+ 60.0	120.0	0
1	4 29.3	+ 59.6	119.7	3 59.5	+ 59.8	119.8	3 29.7	+ 59.8	119.8	2 59.8	+ 59.9	119.9	2 29.9	+ 59.9	119.9	2 00.0	+ 59.9	120.0	1 30.0	+ 60.0	120.0	1 00.0	+ 60.0	120.0	1
2	5 28.9	+ 59.7	119.6	4 59.3	+ 59.7	119.7	4 29.5	+ 59.8	119.8	3 59.7	+ 59.9	119.8	3 29.8	+ 60.0	119.9	2 59.9	+ 60.0	119.9	2 30.0	+ 60.0	120.0	2 00.0	+ 60.0	120.0	2
3	6 28.6	+ 59.7	119.5	5 59.0	+ 59.8	119.6	5 29.3	+ 59.9	119.7	4 59.6	+ 59.9	119.8	4 29.8	+ 59.9	119.8	3 59.9	+ 60.0	119.9	3 30.0	+ 60.0	120.0	3 00.0	+ 60.0	120.0	3
4	7 28.3	+ 59.6	119.4	6 58.8	+ 59.7	119.5	6 29.2	+ 59.8	119.6	5 59.5	+ 59.9	119.7	5 29.7	+ 60.0	119.8	4 59.9	+ 60.0	119.9	4 30.0	+ 60.0	120.0	4 00.0	+ 60.0	120.0	4
5	8 27.9	+ 59.7	119.3	7 58.5	+ 59.8	119.4	7 29.0	+ 59.8	119.5	6 59.4	+ 59.9	119.6	6 29.7	+ 59.9	119.7	5 59.9	+ 59.9	119.8	5 30.0	+ 60.0	119.9	5 00.0	+ 60.0	120.0	5
6	9 27.6	+ 59.6	119.2	8 58.3	+ 59.7	119.3	8 28.8	+ 59.8	119.4	7 59.3	+ 59.9	119.6	7 29.6	+ 59.9	119.7	6 59.8	+ 60.0	119.8	6 30.0	+ 60.0	119.9	6 00.0	+ 60.0	120.0	6
7	10 27.2	+ 59.7	119.1	9 58.0	+ 59.7	119.2	9 28.6	+ 59.9	119.4	8 59.2	+ 59.8	119.5	8 29.5	+ 60.0	119.6	7 59.8	+ 60.0	119.8	7 30.0	+ 59.9	119.9	7 00.0	+ 60.0	120.0	7
8	11 26.9	+ 59.6	119.0	10 57.7	+ 59.8	119.1	10 28.5	+ 59.8	119.3	9 59.0	+ 59.9	119.5	9 29.5	+ 59.9	119.6	8 59.8	+ 59.9	119.7	8 29.9	+ 60.0	119.9	8 00.0	+ 60.0	120.0	8
9	12 26.5	+ 59.7	118.8	11 57.5	+ 59.7	119.0	11 28.3	+ 59.8	119.2	10 58.9	+ 59.9	119.4	10 29.4	+ 59.9	119.6	9 59.7	+ 60.0	119.7	9 29.9	+ 60.0	119.9	9 00.0	+ 60.0	120.0	9
10	13 26.2	+ 59.6	118.7	12 57.2	+ 59.8	118.9	12 28.1	+ 59.8	119.1	11 58.8	+ 59.9	119.3	11 29.3	+ 60.0	119.5	10 59.7	+ 60.0	119.7	10 29.9	+ 60.0	119.8	10 00.0	+ 60.0	120.0	10
11	14 25.8	+ 59.7	118.6	13 57.0	+ 59.7	118.8	13 27.9	+ 59.8	119.1	12 58.7	+ 59.9	119.3	12 29.3	+ 59.9	119.5	11 59.7	+ 60.0	119.6	11 29.9	+ 60.0	119.8	11 00.0	+ 60.0	120.0	11
12	15 25.5	+ 59.6	118.5	14 56.7	+ 59.7	118.7	14 27.7	+ 59.9	119.0	13 58.6	+ 59.9	119.2	13 29.2	+ 59.9	119.4	12 59.7	+ 59.9	119.6	12 29.9	+ 60.0	119.8	12 00.0	+ 60.0	120.0	12
13	16 25.1	+ 59.6	118.4	15 56.4	+ 59.8	118.6	15 27.6	+ 59.8	118.9	14 58.5	+ 59.8	119.1	14 29.1	+ 60.0	119.4	13 59.6	+ 60.0	119.6	13 29.9	+ 60.0	119.8	13 00.0	+ 60.0	120.0	13
14	17 24.7	+ 59.7	118.3	16 56.2	+ 59.7	118.6	16 27.4	+ 59.8	118.8	15 58.3	+ 59.9	119.1	15 29.1	+ 59.9	119.3	14 59.6	+ 60.0	119.6	14 29.9	+ 60.0	119.8	14 00.0	+ 60.0	120.0	14
15	18 24.4	+ 59.6	118.2	17 55.9	+ 59.7	118.5	17 27.2	+ 59.8	118.7	16 58.2	+ 59.9	119.0	16 29.0	+ 59.9	119.3	15 59.6	+ 59.9	119.5	15 29.9	+ 60.0	119.8	15 00.0	+ 60.0	120.0	15
16	19 24.0	+ 59.6	118.0	18 55.6	+ 59.8	118.4	18 27.0	+ 59.8	118.6	17 58.1	+ 59.9	118.9	17 28.9	+ 60.0	119.2	16 59.5	+ 60.0	119.5	16 29.9	+ 60.0	119.7	16 00.0	+ 60.0	120.0	16
17	20 23.6	+ 59.6	117.9	19 55.4	+ 59.7	118.2	19 26.8	+ 59.8	118.6	18 58.0	+ 59.9	118.9	18 28.9	+ 59.9	119.2	17 59.5	+ 60.0	119.5	17 29.9	+ 60.0	119.7	17 00.0	+ 60.0	120.0	17
18	21 23.2	+ 59.6	117.8	20 55.1	+ 59.7	118.1	20 26.6	+ 59.8	118.5	19 57.9	+ 59.8	118.8	19 28.8	+ 59.9	119.1	18 59.5	+ 59.9	119.4	18 29.9	+ 60.0	119.7	18 00.0	+ 60.0	120.0	18
19	22 22.8	+ 59.6	117.7	21 54.8	+ 59.7	118.0	21 26.4	+ 59.8	118.4	20 57.7	+ 59.9	118.7	20 28.7	+ 60.0	119.1	19 59.4	+ 60.0	119.4	19 29.9	+ 60.0	119.7	19 00.0	+ 60.0	120.0	19
20	23 22.4	+ 59.6	117.6	22 54.5	+ 59.7	117.9	22 26.2	+ 59.8	118.3	21 57.6	+ 59.9	118.7	21 28.7	+ 59.9	119.0	20 59.4	+ 60.0	119.4	20 29.9	+ 59.9	119.7	20 00.0	+ 60.0	120.0	20
21	24 22.0	+ 59.6	117.4	23 54.2	+ 59.7	117.8	23 26.0	+ 59.8	118.2	22 57.5	+ 59.9	118.6	22 28.6	+ 59.9	119.0	21 59.4	+ 60.0	119.3	21 29.8	+ 60.0	119.7	21 00.0	+ 60.0	120.0	21
22	25 21.6	+ 59.6	117.3	24 53.9	+ 59.7	117.7	24 25.8	+ 59.8	118.1	23 57.4	+ 59.8	118.5	23 28.5	+ 60.0	118.9	22 59.4	+ 59.9	119.3	22 29.8	+ 60.0	119.6	22 00.0	+ 60.0	120.0	22
23	26 21.2	+ 59.6	117.2	25 53.6	+ 59.7	117.6	25 25.6	+ 59.8	118.0	24 57.2	+ 59.9	118.4	24 28.5	+ 59.9	118.9	23 59.3	+ 60.0	119.2	23 29.8	+ 60.0	119.6	23 00.0	+ 60.0	120.0	23
24	27 20.8	+ 59.6	117.0	26 53.3	+ 59.7	117.5	26 25.4	+ 59.8	117.9	25 57.1	+ 59.8	118.4	25 28.4	+ 59.9	118.8	24 59.3	+ 60.0	119.2	24 29.8	+ 60.0	119.6	24 00.0	+ 60.0	120.0	24
25	28 20.4	+ 59.5	116.9	27 53.0	+ 59.7	117.4	27 25.2	+ 59.8	117.8	26 56.9	+ 59.9	118.3	26 28.3	+ 59.9	118.7	25 59.3	+ 59.9	119.2	25 29.8	+ 60.0	119.6	25 00.0	+ 60.0	120.0	25
26	29 19.9	+ 59.6	116.8	28 52.7	+ 59.6	117.3	28 25.0	+ 59.7	117.7	27 56.8	+ 59.9	118.2	27 28.2	+ 59.9	118.7	26 59.2	+ 60.0	119.1	26 29.8	+ 60.0	119.6	26 00.0	+ 60.0	120.0	26
27	30 19.5	+ 59.5	116.6	29 52.3	+ 59.7	117.1	29 24.7	+ 59.8	117.6	28 56.7	+ 59.8	118.1	28 28.1	+ 60.0	118.6	27 59.2	+ 59.9	119.1	27 29.8	+ 60.0	119.6	27 00.0	+ 60.0	120.0	27
28	31 19.0	+ 59.6	116.5	30 52.0	+ 59.7	117.0	30 24.5	+ 59.8	117.5	29 56.5	+ 59.9	118.1	29 28.1	+ 59.9	118.6	28 59.1	+ 60.0	119.1	28 29.8	+ 60.0	119.5	28 00.0	+ 60.0	120.0	28
29	32 18.6	+ 59.5	116.3	31 51.7	+ 59.6	116.9	31 24.3	+ 59.7	117.4	30 56.4	+ 59.8	118.0	30 28.0	+ 59.9	118.5	29 59.1	+ 60.0	119.0	29 29.8	+ 60.0	119.5	29 00.0	+ 60.0	120.0	29
30	33 18.1	+ 59.5	116.2	32 51.3	+ 59.7	116.8	32 24.0	+ 59.8	117.3	31 56.2	+ 59.9	117.9	31 27.9	+ 59.9	118.4	30 59.1	+ 59.9	119.0	30 29.8	+ 60.0	119.5	30 00.0	+ 60.0	120.0	30
31	34 17.6	+ 59.5	116.0	33 51.0	+ 59.6	116.6	33 23.8	+ 59.7	117.2	32 56.1	+ 59.8	117.8	32 27.8	+ 59.9	118.4	31 59.0	+ 60.0	118.9	31 29.8	+ 60.0	119.5	31 00.0	+ 60.0	120.0	31
32	35 17.1	+ 59.5	115.9	34 50.6	+ 59.6	116.5	34 23.5	+ 59.8	117.1	33 55.9	+ 59.9	117.7	33 27.7	+ 59.9	118.3	32 59.0	+ 60.0	118.8	32 29.8	+ 59.9	119.5	32 00.0	+ 60.0	120.0	32
33	36 16.6	+ 59.5	115.7	35 50.2	+ 59.7	116.4	35 23.3	+ 59.7	117.0	34 55.8	+ 59.8	117.6	34 27.6	+ 59.9	118.2	33 59.0	+ 59.9	118.8	33 29.7	+ 60.0	119.4	33 00.0	+ 60.0	120.0	33
34	37 16.1	+ 59.4	115.6	37 49.5	+ 59.6	116.1	37 22.8	+ 59.7	116.8	36 55.4	+ 59.8	117.5	36 27.4	+ 60.0	118.1	35 58.9	+ 59.9	118.8	35 29.7	+ 60.0	119.4	35 00.0	+ 60.0	120.0	35
35	38 15.5	+ 59.5	115.4	38 49.5	+ 59.6	116.1	38 22.5	+ 59.7	116.7	37 55.2	+ 59.9	117.4	37 27.4	+ 59.9	118.0	36 58.8	+ 60.0	118.7	36 29.7	+ 60					

**LATITUDE CONTRARY NAME TO DECLINATION**

**L.H.A. 60°, 300°**

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.				
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z					
0	3	29.6	-59.7	119.8	2	59.8	-59.8	119.9	2	29.9	-59.9	119.9	1	59.9	-59.9	119.9	1	30.0	-60.0	120.0	0	30.0	-60.0	120.0	0	0.00	+60.0	60.0	<b>0</b>
1	2	29.9	-59.6	119.9	2	00.0	-59.8	120.0	1	30.0	-59.8	120.0	1	00.0	-59.9	120.0	0	0.0	-59.9	120.0	0	30.0	+60.0	60.0	1	0.00	+60.0	60.0	<b>1</b>
2	1	30.3	-59.7	120.0	1	00.2	-59.7	120.0	0	30.2	-59.8	120.1	0	0.1	-59.8	120.1	0	29.9	+59.9	59.9	1	0.0	+59.9	60.0	2	0.00	+60.0	60.0	<b>2</b>
3	0	30.6	-59.7	120.1	0	00.5	-59.8	120.1	0	29.6	+59.9	59.9	0	59.7	+59.9	59.9	2	29.5	+59.8	59.8	1	59.6	+59.9	59.8	2	29.8	+59.9	59.9	<b>3</b>
4	0	29.1	+59.6	59.8	0	59.3	+59.7	59.8	1	29.5	+59.8	59.8	1	59.6	+59.9	59.8	3	29.7	+60.0	59.8	3	59.9	+59.9	59.9	4	30.0	+60.0	59.9	<b>4</b>
5	1	28.7	+59.7	59.7	1	59.0	+59.8	59.7	2	29.3	+59.8	59.7	2	59.5	+59.9	59.8	4	29.7	+59.9	59.8	4	59.8	+60.0	59.8	5	30.0	+60.0	60.0	<b>5</b>
6	2	28.4	+59.6	59.6	2	58.8	+59.7	59.6	3	29.1	+59.8	59.6	3	59.4	+59.9	59.7	5	29.6	+59.9	59.7	5	59.8	+60.0	59.8	6	30.0	+60.0	60.0	<b>6</b>
7	3	28.0	+59.7	59.4	3	58.5	+59.8	59.5	4	28.9	+59.9	59.6	4	59.3	+59.9	59.6	6	29.5	+60.0	59.7	6	59.8	+60.0	59.9	7	30.0	+59.9	59.9	<b>7</b>
8	4	27.7	+59.7	59.3	4	58.3	+59.7	59.4	5	28.8	+59.8	59.5	5	59.2	+59.9	59.6	7	29.5	+60.0	59.8	7	59.9	+60.0	59.9	8	30.0	+60.0	60.0	<b>8</b>
9	5	27.4	+59.6	59.2	5	58.0	+59.8	59.3	6	28.6	+59.8	59.4	6	59.1	+59.9	59.5	7	29.5	+59.9	59.6	7	59.8	+60.0	59.9	9	30.0	+60.0	60.0	<b>9</b>
10	6	27.0	+59.7	59.1	6	57.8	+59.7	59.2	7	28.4	+59.8	59.3	7	59.0	+59.9	59.5	8	29.4	+59.9	59.6	8	59.7	+60.0	59.7	9	29.9	+60.0	59.9	<b>10</b>
11	7	26.7	+59.6	59.0	7	57.5	+59.8	59.1	8	28.2	+59.9	59.3	8	58.9	+59.8	59.4	9	29.3	+60.0	59.5	9	59.7	+60.0	59.8	11	29.9	+60.0	60.0	<b>11</b>
12	8	26.3	+59.7	58.9	8	57.3	+59.7	59.0	9	28.1	+59.8	59.2	9	58.7	+59.9	59.3	10	29.3	+59.9	59.5	10	59.7	+60.0	59.6	12	29.9	+60.0	60.0	<b>12</b>
13	9	26.0	+59.7	58.8	9	57.0	+59.8	58.9	10	27.9	+59.8	59.1	10	58.6	+59.9	59.3	11	29.2	+60.0	59.4	11	59.6	+60.0	59.6	12	29.9	+60.0	59.8	<b>13</b>
14	10	25.7	+59.6	58.7	10	56.8	+59.7	58.9	11	27.7	+59.8	59.0	11	58.5	+59.9	59.2	12	29.2	+59.9	59.4	12	59.6	+60.0	59.6	13	29.9	+60.0	60.0	<b>14</b>
15	11	25.3	+59.7	58.6	11	56.5	+59.7	58.8	12	27.5	+59.9	58.9	12	58.4	+59.9	59.1	13	29.1	+59.9	59.3	13	59.6	+60.0	59.6	14	29.9	+60.0	59.8	<b>15</b>
16	12	25.0	+59.6	58.5	12	56.2	+59.8	58.7	13	27.4	+59.8	58.9	13	58.3	+59.9	59.1	14	29.0	+60.0	59.3	14	59.6	+59.9	59.5	15	29.9	+60.0	60.0	<b>16</b>
17	13	24.6	+59.7	58.4	13	56.0	+59.7	58.6	14	27.2	+59.8	58.8	14	58.2	+59.9	59.0	15	29.0	+59.9	59.2	15	59.5	+60.0	59.5	16	29.9	+60.0	60.0	<b>17</b>
18	14	24.3	+59.6	58.3	14	55.7	+59.8	58.5	15	27.0	+59.8	58.7	15	58.1	+59.8	59.9	16	28.9	+59.9	59.2	16	59.5	+60.0	59.5	17	29.9	+60.0	60.0	<b>18</b>
19	15	23.9	+59.6	58.1	15	55.5	+59.7	58.4	16	26.8	+59.8	58.6	16	57.9	+59.9	58.9	17	28.8	+60.0	59.1	17	59.5	+59.9	59.4	18	29.9	+60.0	60.0	<b>19</b>
20	16	23.5	+59.7	58.0	16	55.2	+59.7	58.3	17	26.6	+59.8	58.5	17	57.8	+59.9	58.8	18	28.8	+59.9	59.1	18	59.4	+60.0	59.4	19	29.9	+60.0	59.7	<b>20</b>
21	17	23.2	+59.6	57.9	17	54.9	+59.7	58.2	18	26.4	+59.8	58.5	18	57.7	+59.9	58.7	19	28.7	+59.9	59.0	19	59.4	+60.0	59.4	20	29.9	+59.9	59.7	<b>21</b>
22	18	22.8	+59.6	57.8	18	54.6	+59.8	58.1	19	26.2	+59.8	58.4	19	57.6	+59.8	58.7	20	28.6	+59.9	59.0	20	59.4	+59.9	59.3	21	29.8	+60.0	60.0	<b>22</b>
23	19	22.4	+59.6	57.7	19	54.4	+59.7	58.0	20	26.0	+59.9	58.3	20	57.4	+59.9	58.6	21	28.5	+60.0	58.9	21	59.3	+60.0	59.3	22	29.8	+60.0	60.0	<b>23</b>
24	20	22.0	+59.7	57.6	20	54.1	+59.7	57.9	21	25.9	+59.8	58.2	21	57.3	+59.9	58.5	22	28.5	+59.9	58.9	22	59.3	+60.0	59.2	23	29.8	+60.0	60.0	<b>24</b>
25	21	21.7	+59.6	57.4	21	53.8	+59.7	57.8	22	25.7	+59.8	58.1	22	57.2	+59.9	58.5	23	28.4	+59.9	58.8	23	59.3	+59.9	59.2	24	29.8	+60.0	59.6	<b>25</b>
26	22	21.3	+59.6	57.3	22	53.5	+59.7	57.7	23	25.5	+59.7	58.0	23	57.1	+59.8	58.4	24	28.3	+60.0	58.8	24	59.2	+60.0	59.2	25	29.8	+60.0	60.0	<b>26</b>
27	23	20.9	+59.6	57.2	23	53.2	+59.7	57.6	24	25.2	+59.8	57.9	24	56.9	+59.9	58.3	25	28.3	+59.9	58.7	25	59.2	+60.0	59.1	26	29.8	+60.0	60.0	<b>27</b>
28	24	20.5	+59.6	57.1	24	52.9	+59.7	57.4	25	25.0	+59.8	57.8	25	56.8	+59.9	58.3	26	28.2	+59.9	58.7	26	59.2	+59.9	59.1	27	29.8	+60.0	60.0	<b>28</b>
29	25	20.1	+59.6	56.9	25	52.6	+59.7	57.3	26	24.8	+59.8	57.8	26	56.7	+59.8	58.2	27	28.1	+59.9	58.6	27	59.1	+60.0	59.1	28	29.8	+60.0	60.0	<b>29</b>
30	26	19.7	+59.5	56.8	26	52.3	+59.7	57.2	27	24.6	+59.8	57.7	27	56.5	+59.9	58.1	28	28.0	+59.9	58.6	28	59.1	+60.0	59.0	29	29.8	+60.0	59.5	<b>30</b>
31	27	19.2	+59.6	56.7	27	52.0	+59.7	57.1	28	24.4	+59.8	57.6	28	56.4	+59.8	58.0	29	27.9	+60.0	58.5	29	59.1	+59.9	59.5	30	29.8	+60.0	60.0	<b>31</b>
32	28	18.8	+59.6	56.5	28	51.7	+59.7	57.0	29	24.2	+59.7	57.5	29	56.2	+59.9	57.9	30	27.9	+59.9	58.4	30	59.0	+60.0	58.9	31	29.8	+60.0	60.0	<b>32</b>
33	29	18.4	+59.5	56.4	29	51.4	+59.6	56.9	30	23.9	+59.8	57.4	30	56.1	+59.8	57.9	31	27.8	+59.9	58.4	31	59.0	+60.0	58.9	32	29.7	+60.0	60.0	<b>33</b>
34	30	17.9	+59.6	56.3	30	51.0	+59.7	56.8	31	23.7	+59.8	57.3	31	51.5	+59.9	57.8	32	27.7	+59.9	58.3	32	59.0	+59.9	58.3	33	29.7	+60.0	60.0	<b>34</b>
35	31	17.5	+59.5	56.1	31	50.7	+59.6	56.6	32	23.5	+59.7	57.2	32	55.8	+59.8	57.7	33	27.6	+59.9	58.2	33	58.9	+60.0	58.8	34	29.7	+60.0	60.0	<b>35</b>
36	32	17.0	+59.5	56.0	32	50.3	+59.7	56.5	33	23.2	+59.8	57.0	33	55.6	+59.9	57.6	34	27.5	+59.9	58.2	34	58.9	+59.9	58.8	35	29.7	+60.0	60.0	<b>36</b>
37	33	16.5	+59.5	55.8	33	50.0	+59.6	56.4	34	23.0	+59.7	56.9	34	55.5	+59.8	57.5	35	27.4	+59.9	58.1	35	58.8	+60.0						

61°, 299° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.																					
Dec.	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Dec.																					
0	3 23.2 + 59.7 118.8	2 54.3 + 59.7 118.9	2 25.3 + 59.8 118.9	1 56.3 + 59.9 118.9	1 27.2 + 60.0 119.0	0 58.2 + 59.9 119.0	0 29.1 + 60.0 119.0	0 00.0 + 60.0 119.0	0 00.0 + 60.0 119.0	0	4 22.9 + 59.6 118.7	3 54.0 + 59.8 118.8	3 25.1 + 59.9 118.8	2 56.2 + 59.9 118.9	2 27.2 + 59.9 118.9	1 58.1 + 60.0 119.0	1 29.1 + 60.0 119.0	1 00.0 + 60.0 119.0	1	5 22.5 + 59.7 118.6	4 53.8 + 59.7 118.7	4 25.0 + 59.8 118.8	3 56.1 + 59.8 118.8	3 27.1 + 59.9 118.9	2 58.1 + 60.0 118.9	2 29.1 + 60.0 119.0	2 00.0 + 60.0 119.0	2	6 22.2 + 59.7 118.5	5 53.5 + 59.8 118.6	5 24.8 + 59.8 118.7	4 55.9 + 59.9 118.8	4 27.0 + 60.0 118.8	3 58.1 + 60.0 118.9	3 29.1 + 60.0 119.0	3 00.0 + 60.0 119.0	3	7 21.9 + 59.6 118.4	6 53.3 + 59.7 118.5	6 24.6 + 59.8 118.6	5 55.8 + 59.9 118.7	5 27.0 + 59.9 118.8	4 58.1 + 59.9 118.9	4 29.1 + 60.0 118.9	4 00.0 + 60.0 119.0	4
5	8 21.5 + 59.7 118.3	7 53.0 + 59.8 118.4	7 24.4 + 59.8 118.5	6 55.7 + 59.9 118.6	6 26.9 + 60.0 118.7	5 58.0 + 60.0 118.8	5 29.1 + 59.9 118.9	5 00.0 + 60.0 119.0	5 00.0 + 60.0 119.0	5	9 21.2 + 59.6 118.2	8 52.8 + 59.7 118.3	8 24.2 + 59.9 118.4	7 55.6 + 59.9 118.6	7 26.9 + 59.9 118.7	6 58.0 + 60.0 118.8	6 29.0 + 60.0 118.9	6 00.0 + 60.0 119.0	6	10 20.8 + 59.6 118.1	9 52.5 + 59.7 118.2	9 24.1 + 59.8 118.4	8 55.5 + 59.9 118.5	8 26.8 + 59.9 118.6	7 58.0 + 59.9 118.8	7 29.0 + 60.0 118.9	7 00.0 + 60.0 119.0	7	11 20.4 + 59.7 118.0	10 52.2 + 59.8 118.1	10 23.9 + 59.8 118.3	9 55.4 + 59.9 118.4	9 26.7 + 60.0 118.6	8 57.9 + 60.0 118.7	8 29.0 + 60.0 118.9	8 00.0 + 60.0 119.0	8	12 20.1 + 59.6 117.8	11 52.0 + 59.7 118.0	11 23.7 + 59.8 118.2	10 55.3 + 59.8 118.4	10 26.7 + 59.9 118.5	9 57.9 + 60.0 118.7	9 29.0 + 60.0 118.9	9 00.0 + 60.0 119.0	9
10	13 19.7 + 59.7 117.7	12 51.7 + 59.8 117.9	12 23.5 + 59.8 118.1	11 55.1 + 59.9 118.3	11 26.6 + 59.9 118.5	10 57.9 + 60.0 118.7	10 29.0 + 60.0 118.8	10 00.0 + 60.0 119.0	10 00.0 + 60.0 119.0	10	14 19.4 + 59.6 117.6	13 51.5 + 59.7 117.8	13 23.3 + 59.9 118.1	12 55.0 + 59.9 118.3	12 26.5 + 60.0 118.6	11 57.9 + 59.9 118.6	11 29.0 + 60.0 118.8	11 00.0 + 60.0 119.0	11	15 19.0 + 59.6 117.5	14 51.2 + 59.7 117.7	14 23.2 + 59.8 118.0	13 54.9 + 59.9 118.2	13 26.5 + 59.9 118.4	12 57.8 + 60.0 118.6	12 29.0 + 60.0 118.8	12 00.0 + 60.0 119.0	12	16 18.6 + 59.7 117.4	15 50.9 + 59.7 117.6	15 23.0 + 59.8 117.9	14 54.8 + 59.9 118.1	14 26.4 + 59.9 118.4	13 57.8 + 60.0 118.6	13 29.0 + 60.0 118.8	13 00.0 + 60.0 119.0	13	17 18.3 + 59.6 117.3	16 50.6 + 59.8 117.5	16 22.8 + 59.8 117.8	15 54.7 + 59.8 118.1	15 26.3 + 60.0 118.3	14 57.8 + 59.9 118.5	14 29.0 + 60.0 118.8	14 00.0 + 60.0 119.0	14
15	18 17.9 + 59.6 117.2	17 50.4 + 59.7 117.4	17 22.6 + 59.8 117.7	16 54.5 + 59.9 118.0	16 26.3 + 59.9 118.3	15 57.7 + 60.0 118.5	15 29.0 + 60.0 118.8	15 00.0 + 60.0 119.0	15 00.0 + 60.0 119.0	15	16 17.5 + 59.6 117.0	18 50.1 + 59.7 117.3	18 22.4 + 59.8 117.6	17 54.4 + 59.9 117.9	17 26.2 + 59.9 118.2	16 57.7 + 60.0 118.5	16 29.0 + 60.0 118.7	16 00.0 + 60.0 119.0	16	17 20.1 + 59.6 116.9	19 49.8 + 59.7 117.2	19 22.2 + 59.8 117.6	18 54.3 + 59.9 117.9	18 26.1 + 60.0 118.2	17 57.7 + 59.9 118.4	17 29.0 + 60.0 118.7	17 00.0 + 60.0 119.0	17	18 21.6 + 59.6 116.8	20 49.5 + 59.7 117.1	20 22.0 + 59.8 117.5	19 54.2 + 59.8 117.8	19 26.1 + 59.9 118.1	18 57.6 + 60.0 118.4	18 29.0 + 59.9 118.7	18 00.0 + 60.0 119.0	18	19 22.6 + 59.6 116.7	21 49.2 + 59.7 117.0	21 21.8 + 59.8 117.4	20 54.0 + 59.9 117.7	20 26.0 + 59.9 118.1	19 57.6 + 60.0 118.4	19 28.9 + 60.0 118.7	19 00.0 + 60.0 119.0	19
20	23 15.9 + 59.6 116.5	22 48.9 + 59.7 116.9	22 21.6 + 59.8 117.3	21 53.9 + 59.9 117.7	21 25.9 + 59.9 118.0	20 57.6 + 59.9 118.3	20 28.9 + 60.0 118.7	20 00.0 + 60.0 119.0	20 00.0 + 60.0 119.0	20	21 45.5 + 59.6 116.4	23 48.6 + 59.7 116.8	23 21.4 + 59.8 117.2	22 53.8 + 59.9 117.6	22 25.8 + 60.0 117.9	21 57.5 + 60.0 118.3	21 28.9 + 60.0 118.7	21 00.0 + 60.0 119.0	21	22 45.1 + 59.6 116.3	24 48.3 + 59.7 116.7	24 21.2 + 59.8 117.1	23 53.7 + 59.8 117.5	23 25.8 + 59.9 117.9	22 57.5 + 60.0 118.3	22 28.9 + 60.0 118.6	22 00.0 + 60.0 119.0	22	23 46.7 + 59.6 116.2	25 48.0 + 59.7 116.6	25 21.0 + 59.8 117.0	24 53.5 + 59.9 117.4	24 25.7 + 59.9 117.8	23 57.5 + 59.9 118.2	23 28.9 + 60.0 118.6	23 00.0 + 60.0 119.0	23	24 47.3 + 59.5 116.0	26 47.7 + 59.7 116.5	26 20.8 + 59.7 116.9	25 53.4 + 59.8 117.4	25 25.6 + 59.9 117.8	24 57.4 + 60.0 118.2	24 28.9 + 60.0 118.6	24 00.0 + 60.0 119.0	24
25	28 13.8 + 59.6 115.9	27 47.4 + 59.7 116.4	27 20.5 + 59.8 116.8	26 53.2 + 59.9 117.3	26 25.5 + 60.0 117.7	25 57.4 + 60.0 118.2	25 28.9 + 60.0 118.6	25 00.0 + 60.0 119.0	25 00.0 + 60.0 119.0	25	26 13.4 + 59.5 115.7	28 47.1 + 59.6 116.2	28 20.3 + 59.8 116.7	27 53.1 + 59.9 117.2	27 25.5 + 59.9 117.7	26 57.4 + 59.9 118.1	26 28.9 + 60.0 118.6	26 00.0 + 60.0 119.0	26	27 30.9 + 59.6 115.6	29 46.7 + 59.7 116.1	29 20.1 + 59.8 116.6	28 53.0 + 59.8 117.1	28 25.4 + 59.9 117.6	27 57.3 + 60.0 118.1	27 28.9 + 60.0 118.5	27 00.0 + 60.0 119.0	27	28 31.5 + 59.5 115.5	30 46.4 + 59.7 116.0	30 19.9 + 59.7 116.5	29 52.8 + 59.9 117.0	29 25.3 + 59.9 117.6	28 57.3 + 60.0 118.0	28 28.9 + 60.0 118.5	28 00.0 + 60.0 119.0	28	29 32.0 + 59.5 115.3	31 46.1 + 59.6 115.9	31 19.6 + 59.8 116.4	30 52.7 + 59.8 117.0	30 25.2 + 59.9 117.5	29 57.3 + 59.9 118.0	29 28.9 + 60.0 118.5	29 00.0 + 60.0 119.0	29
30	33 11.5 + 59.5 115.2	32 45.7 + 59.6 115.7	32 19.4 + 59.7 116.3	31 52.5 + 59.9 116.9	31 25.1 + 59.9 117.4	30 57.2 + 60.0 118.0	30 28.9 + 59.9 118.5	30 00.0 + 60.0 119.0	30 00.0 + 60.0 119.0	30	34 11.0 + 59.5 115.0	33 45.3 + 59.7 115.6	33 19.1 + 59.8 116.2	32 52.4 + 59.8 116.8	32 25.0 + 59.9 117.4	31 57.2 + 60.0 117.9	31 28.8 + 60.0 118.5	31 00.0 + 60.0 119.0	31	35 10.5 + 59.5 114.8	34 45.0 + 59.6 115.5	34 18.9 + 59.7 116.1	33 52.2 + 59.8 116.7	33 24.9 + 60.0 117.3	32 57.2 + 59.9 117.9	32 28.8 + 60.0 118.4	32 00.0 + 60.0 119.0	32	36 10.0 + 59.4 114.7	35 44.6 + 59.6 115.3	35 18.6 + 59.7 116.0	34 52.0 + 59.9 116.6	34 24.9 + 59.9 117.2	33 57.1 + 60.0 117.8	33 28.8 + 60.0 118.4	33 00.0 + 60.0 119.0	33	37 09.4 + 59.5 114.5	36 44.2 + 59.6 115.2	36 18.3 + 59.8 115.9	35 51.9 + 59.8 116.5	35 24.8 + 59.9 117.2	34 57.1 + 59.9 117.8	34 28.8 + 60.0 118.4	34 00.0 + 60.0 119.0	34
35	38 08.9 + 59.4 114.4	37 43.8 + 59.6 115.1	37 18.1 + 59.7 115.8	36 51.7 + 59.8 116.4	36 24.7 + 59.9 117.1	35 57.0 + 60.0 117.7	35 28.8 + 60.0 118.4	35 00.0 + 60.0 119.0	35 00.0 + 60.0 119.0	35	39 08.3 + 59.5 114.2	38 43.4 + 59.6 114.9	38 17.8 + 59.7 115.6	37 51.5 + 59.8 116.3	37 24.6 + 59.9 117.0	36 57.0 + 59.9 117.7	36 28.8 + 60.0 118.4	36 00.0 + 60.0 119.0	36	40 07.8 + 59.4 114.0	39 43.0 + 59.6 114.8	39 17.5 + 59.7 115.5	38 51.3 + 59.8 116.2	38 24.5 + 59.9 117.0	37 56.9 + 60.0 117.7	37 28.8 + 60.0 118.5	37 00.0 + 60.0 119.0	37	41 07.2 + 59.4 113.8	40 42.6 + 59.5 114.6	40 17.2 + 59.7 115.4	39 51.1 + 59.8 116.1	39 24.4 + 59.9 116.8	38 56.9 + 60.0 117.6	38 28.8 + 60.0 118.3	38 00.0 + 60.0 119.0	38	42 06.6 + 59.3 113.6	41 42.1 + 59.6 114.4	41 16.9 + 59.7 115.2	40 50.9 + 59.8 116.0	40 24.3 + 59.8 116.8	39 56.9 + 59.9 117.5	39 28.8 + 59.9 118.3	39 00.0 + 60.0 119.0	39
40	43 05.9 + 59.4 113.4	42 41.7 + 59.5 114.3	42 16.6 + 59.7 115.1	41 50.7 + 59.8 115.9	41 24.1 + 59.9 116.7	40 56.8 + 60.0 117.5	40 28.7 + 60.0 118.3	40 00.0 + 60.0 119.0	40 00.0 + 60.0 119.0	40	44 05.3 + 59.3 113.2	43 41.2 + 59.5 114.1	43 16.3 + 59.6 115.0	42 50.5 + 59.8 115.8	42 24.0 + 59.9 116.6	41 56.8 + 59.9 117.4	41 28.7 + 60.0 118.2	41 00.0 + 60.0 119.0	41	45 04.6 + 59.3 113.0	44 40.7 + 59.5 113.9	44 15.9 + 59.7 114.8	43 50.3 + 59.8 115.7	43 23.9 + 59.9 116.5	42 56.7 + 59.6 117.4	42 28.7 + 60.0 118.2	42 00.0 + 60.0 119.0	42	46 03.9 + 59.3 112.8	45 40.2 + 59.5 113.7	45 15.6 + 59.6 114.7	44 50.1 + 59.8 115.6	44 23.8 + 59.9 116.5	43 56.7 + 59.9 117.3	43 28.7 + 60.0 118.2	43 00.0 + 60.0 119.0	43	47 03.2 + 59.2 112.6	46 39.7 + 59.4 113.5	46 15.2 + 59.7 114.5	45 49.9 + 59.8 115.5	45 23.7 + 59.8 116.4	44 56.6 + 59.9 117.3	44 28.7 + 60.0 118.1	44 00.0 + 60.0 119.0	44
45	48 02.4 + 59.2 112.3	47 39.1 + 59.5 113.4	47 14.9 + 59.6 114.3	46 49.7 + 59.7 115.3	46 23.5 + 59.8 116.3	45 56.5 + 59.9 117.3	45 28.7 + 60.0 118.1	45 00.0 + 60.0 119.0	45 00.0 + 60.0 119.0	45	46 01.6 + 59.2 112.1	48 38.6 + 59.4 113.1	48 14.5 + 59.6 114.2	47 49.4 + 59.8 115.2	47 23.4 + 59.9 116.2	46 56.5 + 59.9 117.1	46 28.7 + 60.0 118.1	46 00.0 + 60.0 119.0	46	48 00.8 + 59.2 111.8	49 38.0 + 59.4 112.9	49 14.1 + 59.5 114.0	48 49.2 + 59.7 115.1	4																						

**LATITUDE CONTRARY NAME TO DECLINATION**

**L.H.A. 61°, 299°**

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.									
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z										
0	3	23.2	-59.6	118.8	2	54.3	-59.8	118.9	2	25.3	-59.8	118.9	1	56.3	-59.9	118.9	1	27.2	-59.9	119.0	0	58.2	-60.0	119.0	0	29.1	-60.0	119.0	0	0.00	+60.0	61.0	<b>0</b>	
1	2	23.6	-59.7	118.9	1	54.5	-59.7	119.0	1	25.5	-59.8	119.0	0	56.4	-59.9	119.0	0	27.3	-59.9	119.0	0	01.8	+60.0	61.0	0	30.9	+60.0	61.0	1	0.00	+60.0	61.0	<b>1</b>	
2	1	23.9	-59.6	119.0	0	54.8	-59.8	119.0	0	25.7	-59.9	119.1	0	03.5	+59.9	60.9	0	32.6	+60.0	60.9	1	01.8	+59.9	61.0	1	30.9	+60.0	61.0	2	0.00	+60.0	61.0	<b>2</b>	
3	0	24.3	-59.7	119.1	0	05.0	+59.7	60.9	0	34.2	+59.8	60.9	1	03.4	+59.9	60.9	1	32.6	+59.9	60.9	2	01.7	+60.0	60.9	2	30.9	+60.0	61.0	3	0.00	+60.0	61.0	<b>3</b>	
4	4	0	35.4	+59.7	60.8	1	04.7	+59.8	60.8	1	34.0	+59.8	60.8	2	03.3	+59.9	60.8	2	32.5	+60.0	60.9	3	01.7	+60.0	60.9	3	30.9	+60.0	60.9	4	0.00	+60.0	61.0	<b>4</b>
5	5	1	35.1	+59.6	60.6	2	04.5	+59.7	60.7	2	33.8	+59.8	60.7	3	03.2	+59.8	60.8	3	32.5	+59.9	60.8	4	01.7	+60.0	60.9	4	30.9	+60.0	60.9	5	0.00	+60.0	61.0	<b>5</b>
6	6	2	34.7	+59.7	60.5	3	04.2	+59.8	60.6	3	33.6	+59.8	60.6	4	03.0	+59.9	60.7	4	32.4	+59.9	60.8	5	01.7	+59.9	60.8	5	30.9	+60.0	60.9	6	0.00	+60.0	61.0	<b>6</b>
7	7	3	34.4	+59.6	60.4	4	04.0	+59.7	60.5	4	33.5	+59.8	60.6	5	02.9	+59.9	60.6	5	32.3	+60.0	60.7	6	01.6	+60.0	60.8	6	30.9	+60.0	60.9	7	0.00	+60.0	61.0	<b>7</b>
8	8	4	34.0	+59.7	60.3	5	03.7	+59.7	60.4	5	33.3	+59.8	60.5	6	02.8	+59.9	60.6	6	32.3	+59.9	60.7	7	01.6	+60.0	60.8	7	30.9	+59.9	60.9	8	0.00	+60.0	61.0	<b>8</b>
9	9	5	33.7	+59.6	60.2	6	03.4	+59.8	60.3	6	33.1	+59.8	60.4	7	02.7	+59.9	60.5	7	32.2	+59.9	60.6	8	01.6	+60.0	60.7	8	30.8	+60.0	60.9	9	0.00	+60.0	61.0	<b>9</b>
10	10	6	33.3	+59.7	60.1	7	03.2	+59.7	60.2	7	32.9	+59.9	60.3	8	02.6	+59.9	60.4	8	32.1	+60.0	60.6	9	01.6	+59.9	60.7	9	30.8	+60.0	60.8	10	0.00	+60.0	61.0	<b>10</b>
11	11	7	33.0	+59.6	60.0	8	02.9	+59.8	60.1	8	32.8	+59.8	60.2	9	02.5	+59.9	60.4	9	32.1	+59.9	60.5	10	01.5	+60.0	60.7	10	30.8	+60.0	60.8	11	0.00	+60.0	61.0	<b>11</b>
12	12	8	32.6	+59.7	59.9	9	02.7	+59.7	60.0	9	32.6	+59.8	60.2	10	02.4	+59.8	60.3	10	32.0	+59.9	60.5	11	01.5	+60.0	60.6	11	30.8	+60.0	60.8	12	0.00	+60.0	61.0	<b>12</b>
13	13	9	32.3	+59.6	59.8	10	02.4	+59.8	59.9	10	32.4	+59.8	60.1	11	02.2	+59.9	60.3	11	31.9	+60.0	60.4	12	01.5	+59.9	60.6	12	30.8	+60.0	60.8	13	0.00	+60.0	61.0	<b>13</b>
14	14	10	31.9	+59.7	59.7	11	02.2	+59.7	59.8	11	32.2	+59.8	60.0	12	02.1	+59.9	60.2	12	31.9	+59.9	60.4	13	01.4	+60.0	60.6	13	30.8	+60.0	60.8	14	0.00	+60.0	61.0	<b>14</b>
15	15	11	31.6	+59.6	59.6	12	01.9	+59.7	59.7	12	32.0	+59.9	59.9	13	02.0	+59.9	60.1	13	31.8	+59.9	60.3	14	01.4	+60.0	60.5	14	30.8	+60.0	60.8	15	0.00	+60.0	61.0	<b>15</b>
16	16	12	31.2	+59.7	59.5	13	01.6	+59.8	59.6	13	31.9	+59.8	59.9	14	01.9	+59.9	60.1	14	31.7	+60.0	60.3	15	01.4	+59.9	60.5	15	30.8	+60.0	60.8	16	0.00	+60.0	61.0	<b>16</b>
17	17	13	30.9	+59.6	59.3	14	01.4	+59.7	59.6	14	31.7	+59.8	59.8	15	01.8	+59.9	60.0	15	31.7	+59.9	60.2	16	01.3	+60.0	60.5	16	30.8	+60.0	60.7	17	0.00	+60.0	61.0	<b>17</b>
18	18	14	30.5	+59.6	59.2	15	01.1	+59.7	59.5	15	31.5	+59.8	59.7	16	01.7	+59.8	59.9	16	31.6	+59.9	60.2	17	01.3	+60.0	60.4	17	30.8	+60.0	60.7	18	0.00	+60.0	61.0	<b>18</b>
19	19	15	30.1	+59.7	59.1	16	00.8	+59.8	59.4	16	31.3	+59.8	59.6	17	01.5	+59.9	59.9	17	31.5	+60.0	60.1	18	01.3	+60.0	60.4	18	30.8	+60.0	60.7	19	0.00	+60.0	61.0	<b>19</b>
20	20	16	29.8	+59.6	59.0	17	00.6	+59.7	59.3	17	31.1	+59.8	59.5	18	01.4	+59.9	59.8	18	31.5	+59.9	60.1	19	01.3	+59.9	60.4	19	30.8	+60.0	60.7	20	0.00	+60.0	61.0	<b>20</b>
21	21	17	29.4	+59.6	58.9	18	00.3	+59.7	59.2	18	30.9	+59.8	59.4	19	01.3	+59.9	59.7	19	31.4	+59.9	60.0	20	01.2	+60.0	60.3	20	30.8	+60.0	60.7	21	0.00	+60.0	61.0	<b>21</b>
22	22	18	29.0	+59.6	58.8	19	00.0	+59.7	59.1	19	30.7	+59.8	59.4	20	01.2	+59.8	59.7	20	31.3	+60.0	60.0	21	01.2	+60.0	60.3	21	30.8	+60.0	60.7	22	0.00	+60.0	61.0	<b>22</b>
23	23	19	28.6	+59.6	58.6	19	59.7	+59.7	59.0	19	30.5	+59.8	59.3	21	01.0	+59.9	59.6	21	31.3	+59.9	59.9	22	01.2	+59.9	60.3	22	30.7	+60.0	60.6	23	0.00	+60.0	61.0	<b>23</b>
24	24	20	28.2	+59.7	58.5	20	59.4	+59.7	58.8	20	30.3	+59.8	59.2	22	00.9	+59.9	59.5	22	31.2	+59.9	59.9	23	01.1	+60.0	60.2	23	30.7	+60.0	60.6	24	0.00	+60.0	61.0	<b>24</b>
25	25	21	27.9	+59.6	58.4	21	59.1	+59.7	58.7	22	30.1	+59.8	59.1	23	00.8	+59.8	59.5	23	31.1	+59.9	59.8	24	01.1	+60.0	60.2	24	30.7	+60.0	60.6	25	0.00	+60.0	61.0	<b>25</b>
26	26	22	27.5	+59.6	58.3	22	58.8	+59.7	58.6	23	29.9	+59.8	59.0	24	00.6	+59.9	59.4	24	31.0	+60.0	59.8	25	01.1	+59.9	60.2	25	30.7	+60.0	60.6	26	0.00	+60.0	61.0	<b>26</b>
27	27	23	27.1	+59.5	58.2	23	58.5	+59.7	58.5	24	29.7	+59.8	58.9	25	00.5	+59.9	59.3	25	31.0	+59.9	59.7	26	01.0	+60.0	60.4	26	30.7	+60.0	60.6	27	0.00	+60.0	61.0	<b>27</b>
28	28	24	26.6	+59.6	58.0	24	58.4	+59.7	58.4	25	29.5	+59.8	58.8	26	00.4	+59.8	59.2	26	30.9	+59.9	59.7	27	01.0	+60.0	60.5	27	30.7	+60.0	60.6	28	0.00	+60.0	61.0	<b>28</b>
29	29	25	26.2	+59.6	57.9	26	57.9	+59.7	57.3	27	30.0	+59.9	57.9	28	00.2	+59.9	57.9	28	30.7	+59.9	59.6	29	00.0	+60.0	60.4	29	30.7	+60.0	60.5	30	0.00	+60.0	61.0	<b>30</b>
30	30	26	25.8	+59.6	57.8	27	29.1	+59.7	57.6	28	30.7	+59.8	57.4	29	00.9	+60.0	60.0	29	30.7	+60.0	60.5	30	00.0	+60.0	61.0	30	0.00	+60.0	61.0	<b>30</b>				
31	31	23.6	23.6	57.1	57.1	32	27.9	+59.7	57.8	33	30.3	+59.9	57.8	34	00.7	+60.0	59.2	34	30.7	+60.0	59.8	35	00.0	+60.0	60.4	35	0.00	+60.0	61.0	<b>35</b>				
32	32	23.1	55.9	56.9	32	55.6	+59.6	57.5	33	27.6	+59.8	58.0	34	30.2	+59.9	58.6	35	00.7	+59.9	59.8	35	30.6	+60.0	60.4	36	0.00	+60.0	61.0	<b>36</b>					
33	33	22.6	55.9	56.																														

62°, 298° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.	
Dec.	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	Dec.	
0	3	16.8	+59.6	117.8	2	48.8	+59.7	117.9	2	20.7	+59.8	117.9	1	52.6	+59.9	117.9	1	24.5	+59.9	118.0	0	56.3	+60.0	118.0	0 00.0 +60.0 118.0	0
1	4	16.4	+59.7	117.7	3	48.5	+59.8	117.8	3	20.5	+59.8	117.8	2	52.5	+59.9	117.9	2	24.4	+59.9	117.9	1	56.3	+60.0	118.0	1 00.0 +60.0 118.0	1
2	5	16.1	+59.6	117.6	4	48.3	+59.7	117.7	4	20.3	+59.9	117.8	3	52.4	+59.9	117.8	3	24.3	+60.0	117.9	2	56.3	+60.0	118.0	2 00.0 +60.0 118.0	2
3	6	15.7	+59.7	117.5	5	48.0	+59.7	117.6	5	20.2	+59.8	117.7	4	52.3	+59.8	117.8	4	24.3	+59.9	117.8	3	56.2	+60.0	117.9	3 00.0 +60.0 118.0	3
4	7	15.4	+59.6	117.4	6	47.7	+59.8	117.5	6	20.0	+59.8	117.6	5	52.1	+59.9	117.7	5	24.2	+60.0	117.8	4	56.2	+60.0	118.0	4 00.0 +60.0 118.0	4
5	8	15.0	+59.7	117.3	7	47.5	+59.7	117.4	7	19.8	+59.8	117.5	6	52.0	+59.9	117.6	6	24.2	+59.9	117.7	5	56.2	+60.0	117.8	5 00.0 +60.0 118.0	5
6	9	14.7	+59.6	117.2	8	47.2	+59.8	117.3	8	19.6	+59.8	117.4	7	51.9	+59.9	117.6	7	24.1	+59.9	117.7	6	56.2	+59.9	117.8	6 00.0 +60.0 118.0	6
7	10	14.3	+59.7	117.1	9	47.0	+59.7	117.2	9	19.4	+59.9	117.4	8	51.8	+59.9	117.5	8	24.0	+60.0	117.6	7	56.1	+60.0	117.8	7 00.0 +60.0 118.0	7
8	11	14.0	+59.6	116.9	10	46.7	+59.7	117.1	10	19.3	+59.8	117.3	9	51.7	+59.9	117.4	9	24.0	+59.9	117.6	8	56.1	+60.0	117.7	8 00.0 +60.0 118.0	8
9	12	13.6	+59.6	116.8	11	46.4	+59.8	117.0	11	19.1	+59.8	117.2	10	51.6	+59.8	117.4	10	23.9	+59.9	117.5	9	56.1	+60.0	117.9	9 00.0 +60.0 118.0	9
10	13	13.2	+59.7	116.7	12	46.2	+59.7	116.9	12	18.9	+59.8	117.1	11	51.4	+59.9	117.3	11	23.8	+60.0	117.5	10	56.0	+60.0	117.7	10 00.0 +60.0 118.0	10
11	14	12.9	+59.6	116.6	13	45.9	+59.7	116.8	13	18.7	+59.8	117.0	12	51.3	+59.9	117.3	12	23.8	+59.9	117.5	11	56.0	+60.0	117.8	11 00.0 +60.0 118.0	11
12	15	12.5	+59.6	116.5	14	45.6	+59.7	116.7	14	18.5	+59.8	117.0	13	51.2	+59.9	117.2	13	23.7	+59.9	117.4	12	56.0	+59.9	117.6	12 00.0 +60.0 118.0	12
13	16	12.1	+59.6	116.4	15	45.3	+59.8	116.6	15	18.3	+59.8	116.9	14	51.1	+59.9	117.1	14	23.6	+60.0	117.4	13	55.9	+60.0	117.6	13 00.0 +60.0 118.0	13
14	17	11.7	+59.6	116.3	16	45.1	+59.7	116.5	16	18.1	+59.8	116.8	15	51.0	+59.8	117.1	14	23.6	+59.9	117.5	14	28.1	+60.0	117.8	14 00.0 +60.0 118.0	14
15	18	11.3	+59.7	116.1	17	44.8	+59.7	116.4	17	17.9	+59.8	116.7	16	50.8	+59.9	117.0	16	23.5	+59.9	117.3	15	55.9	+60.0	117.8	15 00.0 +60.0 118.0	15
16	19	11.0	+59.6	116.0	18	44.5	+59.7	116.3	18	17.7	+59.8	116.6	17	50.7	+59.9	116.9	17	23.4	+59.9	117.2	16	55.9	+59.9	117.5	16 00.0 +60.0 118.0	16
17	20	10.6	+59.6	115.9	19	44.2	+59.7	116.2	19	17.5	+59.8	116.5	18	50.6	+59.9	116.9	18	23.3	+60.0	117.2	17	55.8	+60.0	117.4	17 00.0 +60.0 118.0	17
18	21	10.2	+59.6	115.8	20	43.9	+59.7	116.1	20	17.3	+59.8	116.5	19	50.5	+59.8	116.8	19	23.3	+59.9	117.1	18	55.8	+60.0	117.4	18 00.0 +60.0 118.0	18
19	22	0.98	+59.6	115.7	21	43.6	+59.7	116.0	21	17.1	+59.8	116.4	20	50.3	+59.9	116.7	20	23.2	+59.9	117.0	19	55.8	+60.0	117.4	19 00.0 +60.0 118.0	19
20	23	0.94	+59.5	115.5	22	43.3	+59.7	115.9	22	16.9	+59.8	116.3	21	50.2	+59.9	116.6	21	23.1	+60.0	117.0	20	55.7	+60.0	117.3	20 00.0 +60.0 118.0	20
21	24	0.89	+59.5	115.4	23	43.0	+59.7	115.8	23	16.7	+59.8	116.2	22	50.1	+59.8	116.6	22	23.1	+59.9	116.9	21	55.7	+60.0	117.3	21 00.0 +60.0 118.0	21
22	25	0.85	+59.6	115.3	24	42.7	+59.7	115.7	24	16.5	+59.8	116.1	23	49.9	+59.9	116.5	23	23.0	+59.9	116.9	22	55.7	+59.9	117.3	22 00.0 +60.0 118.0	22
23	26	0.81	+59.6	115.1	25	42.4	+59.7	115.6	25	16.3	+59.8	116.0	24	49.8	+59.9	116.4	24	22.9	+59.9	116.8	23	55.6	+60.0	117.2	23 00.0 +60.0 118.0	23
24	27	0.77	+59.5	115.0	26	42.1	+59.7	115.5	26	16.1	+59.7	115.9	25	49.7	+59.8	116.3	25	22.8	+59.9	116.8	24	55.6	+60.0	117.2	24 00.0 +60.0 118.0	24
25	28	0.72	+59.6	114.9	27	41.8	+59.6	115.3	27	15.8	+59.8	115.8	26	49.5	+59.9	116.3	26	22.7	+60.0	116.7	25	55.6	+59.9	117.2	25 00.0 +60.0 118.0	25
26	29	0.68	+59.5	114.7	28	41.4	+59.7	115.2	28	15.6	+59.8	115.7	27	49.4	+59.8	116.2	27	22.7	+59.9	116.7	26	55.6	+60.0	117.2	26 00.0 +60.0 118.0	26
27	30	0.63	+59.5	114.6	29	41.1	+59.6	115.1	29	15.4	+59.8	115.6	28	49.2	+59.9	116.1	28	22.6	+59.9	116.6	27	55.5	+60.0	117.1	27 00.0 +60.0 118.0	27
28	31	0.58	+59.5	114.4	30	40.7	+59.7	115.0	30	15.2	+59.7	115.5	29	49.1	+59.8	116.0	29	22.5	+59.9	116.5	28	55.5	+59.9	117.0	28 00.0 +60.0 118.0	28
29	32	0.53	+59.6	114.3	31	40.4	+59.6	114.9	31	14.9	+59.8	115.4	30	48.9	+59.9	115.9	30	22.4	+59.9	116.5	29	55.4	+60.0	117.0	29 00.0 +60.0 118.0	29
30	33	0.49	+59.4	114.1	32	40.0	+59.7	114.7	32	14.7	+59.7	115.3	31	48.8	+59.8	115.9	31	22.3	+59.9	116.4	30	55.4	+59.9	117.0	30 00.0 +60.0 118.0	30
31	34	0.43	+59.5	114.0	33	39.7	+59.6	114.6	33	14.4	+59.8	115.2	32	48.6	+59.8	115.8	32	22.2	+59.9	116.4	31	55.3	+60.0	116.9	31 00.0 +60.0 118.0	31
32	35	0.38	+59.5	113.8	34	39.3	+59.6	114.5	34	14.2	+59.7	115.1	33	48.4	+59.9	115.7	33	22.1	+60.0	116.3	32	55.3	+60.0	116.9	32 00.0 +60.0 118.0	32
33	36	0.33	+59.5	113.7	35	38.9	+59.6	114.3	35	13.9	+59.7	115.0	34	48.3	+59.8	115.6	34	22.0	+59.9	116.2	33	55.3	+60.0	117.4	33 00.0 +60.0 118.0	33
34	37	0.28	+59.4	113.5	36	37.1	+59.6	114.0	36	13.7	+59.8	114.7	35	48.1	+59.7	115.3	35	21.9	+59.9	116.1	34	55.2	+60.0	117.4	34 00.0 +60.0 118.0	34
35	38	0.22	+59.4	113.3	37	38.1	+59.8	114.7	37	13.5	+59.8	115.4	36	47.9	+59.8	115.4	36	21.9	+59.9	116.1	35	55.2	+59.9	116.7	35 00.0 +60.0 118.0	35
36	39	0.16	+59.5	113.1	38	37.7	+59.6	113.9	38	13.1	+59.7	114.6	37	47.7	+59.9	115.3	37	21.8	+59.9	116.0	36	55.1	+60.0	116.7	36 00.0 +60.0 118.0	36
37	40	0.11	+59.3	113.0	39	37.3	+59.5	113.7	39	12.8	+59.7	114.5	38	47.6	+59.8	115.2	38	21.7	+59.8	115.9	37	55.1	+59.9	116.6	37 00.0 +60.0 118.0	37
38	41	0.04	+59.4	112.8	40	36.8	+59.6	113.6	40	12.5	+59.7	114.3	39	47.4	+59.8	115.1	39	21.5	+59.9	115.9	38	55.0	+60.0	116.6	38 00.0 +60.0 118.0	38
39	41	59.8																								

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $62^\circ$ ,  $298^\circ$

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.					
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z						
0	3	16.8	-59.7	117.8	2	48.8	-59.8	117.9	2	20.7	-59.8	117.9	1	52.6	-59.9	117.9	1	24.5	-60.0	118.0	0	56.3	-59.9	118.0	0	0.00	+60.0	62.0	<b>0</b>	
1	2	17.1	-59.6	117.9	1	49.0	-59.7	118.0	1	20.9	-59.8	118.0	0	52.7	-59.9	118.0	0	24.5	-59.9	118.0	0	0.36	+60.0	62.0	1	0.00	+60.0	62.0	<b>1</b>	
2	1	17.5	-59.7	118.0	0	49.3	-59.8	118.1	0	21.1	-59.9	118.1	0	0.72	+59.9	61.9	0	35.4	+59.9	61.9	1	3.6	+60.0	62.0	2	0.00	+60.0	62.0	<b>2</b>	
3	0	17.8	-59.6	118.1	0	10.5	+59.7	61.9	0	38.8	+59.8	61.9	1	0.71	+59.8	61.9	1	35.3	+60.0	61.9	2	3.6	+60.0	62.0	3	0.00	+60.0	62.0	<b>3</b>	
4	4	41.8	+59.7	61.7	1	10.2	+59.7	61.8	1	38.6	+59.8	61.8	2	0.69	+59.9	61.8	2	35.3	+59.9	61.8	3	3.6	+59.9	61.9	4	0.00	+60.0	62.0	<b>4</b>	
5	5	41.5	+59.6	61.6	2	0.99	+59.8	61.7	2	38.4	+59.8	61.7	3	0.68	+59.9	61.7	3	35.2	+59.9	61.8	4	0.35	+60.0	61.9	5	0.00	+60.0	62.0	<b>5</b>	
6	6	41.1	+59.7	61.5	3	0.97	+59.7	61.6	3	38.2	+59.8	61.6	4	0.67	+59.9	61.7	4	35.1	+60.0	61.8	5	3.6	+60.0	61.9	6	0.00	+60.0	62.0	<b>6</b>	
7	7	40.8	+59.6	61.4	4	0.94	+59.8	61.5	4	38.1	+59.8	61.6	5	0.66	+59.9	61.6	5	35.1	+59.9	61.7	6	3.6	+60.0	61.9	7	0.00	+60.0	62.0	<b>7</b>	
8	8	40.4	+59.7	61.3	5	0.92	+59.7	61.4	5	37.9	+59.8	61.5	6	0.65	+59.9	61.6	6	35.0	+59.9	61.7	7	0.34	+60.0	61.8	8	0.00	+60.0	62.0	<b>8</b>	
9	9	50.4	+59.6	61.2	6	0.89	+59.8	61.3	6	37.7	+59.8	61.4	7	0.64	+59.9	61.5	7	34.9	+60.0	61.6	8	0.34	+60.0	61.7	9	0.00	+60.0	62.0	<b>9</b>	
10	10	6	39.7	+59.7	61.1	7	0.87	+59.7	61.2	7	37.5	+59.8	61.3	8	0.63	+59.8	61.4	8	34.9	+59.9	61.6	9	0.34	+60.0	61.7	10	0.00	+60.0	62.0	<b>10</b>
11	11	7	39.4	+59.6	61.0	8	0.84	+59.7	61.1	8	37.3	+59.8	61.2	9	0.61	+59.9	61.4	9	34.8	+59.9	61.5	10	0.34	+59.9	61.8	11	0.00	+60.0	62.0	<b>11</b>
12	12	8	39.0	+59.6	60.9	9	0.81	+59.8	61.0	9	37.1	+59.9	61.2	10	0.60	+59.9	61.3	10	34.7	+60.0	61.5	11	0.33	+60.0	61.6	12	0.00	+60.0	62.0	<b>12</b>
13	13	9	38.6	+59.7	60.8	10	0.79	+59.7	60.9	10	37.0	+59.8	61.1	11	0.59	+59.9	61.2	11	34.7	+59.9	61.4	12	0.33	+60.0	61.6	13	0.00	+60.0	62.0	<b>13</b>
14	14	10	38.3	+59.6	60.7	11	0.76	+59.7	60.8	11	36.8	+59.8	61.0	12	0.58	+59.9	61.2	12	34.6	+59.9	61.4	13	0.33	+59.9	61.6	14	0.00	+60.0	62.0	<b>14</b>
15	15	11	37.9	+59.7	60.5	12	0.73	+59.8	60.7	12	36.6	+59.8	60.9	13	0.57	+59.8	61.1	13	34.5	+60.0	61.3	14	0.32	+60.0	61.5	15	0.00	+60.0	62.0	<b>15</b>
16	16	12	37.6	+59.6	60.4	13	0.71	+59.7	60.6	13	36.4	+59.8	60.8	14	0.55	+59.9	61.1	14	34.5	+59.9	61.3	15	0.32	+60.0	61.5	16	0.00	+60.0	62.0	<b>16</b>
17	17	13	37.2	+59.6	60.3	14	0.68	+59.7	60.5	14	36.2	+59.8	60.8	15	0.54	+59.9	61.0	15	34.4	+59.9	61.2	16	0.32	+59.9	61.5	17	0.00	+60.0	62.0	<b>17</b>
18	18	14	36.8	+59.6	60.2	15	0.65	+59.8	60.4	15	36.0	+59.8	60.7	16	0.53	+59.9	60.9	16	34.3	+60.0	61.2	17	0.31	+60.0	61.7	18	0.00	+60.0	62.0	<b>18</b>
19	19	15	36.4	+59.7	60.1	16	0.63	+59.7	60.3	16	35.8	+59.8	60.6	17	0.52	+59.8	60.9	17	34.3	+59.9	61.1	18	0.31	+60.0	61.4	19	0.00	+60.0	62.0	<b>19</b>
20	20	16	36.1	+59.6	60.0	17	0.60	+59.7	60.2	17	35.6	+59.8	60.5	18	0.50	+59.9	60.8	18	34.2	+59.9	61.1	19	0.31	+59.9	61.4	20	0.00	+60.0	62.0	<b>20</b>
21	21	17	35.7	+59.6	59.9	18	0.57	+59.7	60.1	18	35.4	+59.8	60.4	19	0.49	+59.9	60.7	19	34.1	+60.0	61.0	20	0.30	+60.0	61.3	21	0.00	+60.0	62.0	<b>21</b>
22	22	18	35.3	+59.6	59.7	19	0.54	+59.7	60.0	19	35.2	+59.8	60.3	20	0.48	+59.8	60.6	20	34.1	+59.9	61.0	21	0.30	+60.0	61.3	22	0.00	+60.0	62.0	<b>22</b>
23	23	19	34.9	+59.6	59.6	20	0.51	+59.7	59.9	20	35.0	+59.8	60.2	21	0.47	+59.8	60.6	21	34.0	+59.9	60.9	22	0.30	+60.0	61.3	23	0.00	+60.0	62.0	<b>23</b>
24	24	20	34.5	+59.6	59.5	21	0.48	+59.7	59.8	21	34.8	+59.8	60.2	22	0.45	+59.9	60.5	22	33.9	+59.9	60.9	23	0.30	+59.9	61.2	24	0.00	+60.0	62.0	<b>24</b>
25	25	21	34.1	+59.6	59.4	22	0.45	+59.7	59.7	22	34.6	+59.8	60.1	23	0.44	+59.9	60.4	23	33.8	+60.0	60.8	24	0.29	+60.0	61.2	25	0.00	+60.0	62.0	<b>25</b>
26	26	22	33.7	+59.6	59.2	23	0.42	+59.7	59.6	23	34.4	+59.8	60.0	24	0.43	+59.8	60.4	24	33.8	+59.9	60.8	25	0.29	+59.9	61.2	26	0.00	+60.0	62.0	<b>26</b>
27	27	23	33.3	+59.6	59.1	24	0.39	+59.7	59.5	24	34.2	+59.8	59.9	25	0.41	+59.9	60.3	25	33.7	+59.9	60.7	26	0.28	+60.0	61.6	27	0.00	+60.0	62.0	<b>27</b>
28	28	24	32.9	+59.6	59.0	25	0.36	+59.7	59.4	25	34.0	+59.8	59.8	26	0.40	+59.8	60.2	26	33.6	+59.9	60.6	27	0.28	+60.0	61.5	28	0.00	+60.0	62.0	<b>28</b>
29	29	25	32.5	+59.5	58.9	30	0.33	+59.7	59.3	30	32.8	+59.8	59.3	31	0.32	+59.9	59.8	31	33.2	+59.9	60.3	32	0.26	+60.0	60.9	33	0.00	+60.0	62.0	<b>33</b>
30	30	30	32.0	+59.5	58.7	31	0.31	+59.7	58.7	31	32.6	+59.8	59.2	32	0.31	+59.8	59.7	32	33.1	+59.9	60.3	33	0.26	+59.9	61.4	34	0.00	+60.0	62.0	<b>34</b>
31	31	31	29.7	+59.6	58.5	32	0.31	+59.7	59.1	32	32.4	+59.8	59.6	33	0.30	+59.9	59.6	34	0.25	+60.0	60.8	35	0.15	+60.0	61.4	36	0.00	+60.0	62.0	<b>35</b>
32	32	32	29.3	+59.5	57.9	33	0.30	+59.7	58.4	33	32.1	+59.8	59.6	34	0.28	+59.8	60.1	35	0.25	+60.0	60.7	36	0.15	+60.0	61.4	37	0.00	+60.0	62.0	<b>36</b>
33	33	33	28.8	+59.5	57.7	34	0.06	+59.6	58.3	34	31.8	+59.8	58.9	35	0.26	+59.8	59.5	35	32.8	+59.9	60.1	36	0.25	+60.0	61.3	37	0.00	+60.0	62.0	<b>37</b>
34	34	34	28.3	+59.4	57.6	35	0.05	+59.6	58.1	35	31.6	+59.4	58.4	36	0.24	+59.8	59.4	36	32.7	+59.9	60.0	37	0.24	+60.0	61.3	38	0.00	+60.0	62.0	<b>38</b>
35	35	35	27.7	+59.5	57.4	36	0.30	+59.7	57.4	36	31.3	+59.8	59.4	37	0.26	+59.9	59.9	38	0.24	+59.9	60.6	39	0.16	+60.0	61.3	40	0.00	+60.0	62.0	<b>39</b>
36	36	36	27.2	+59.5	57.2	37	0.30	+59.7	57.5	37	31.0	+59.8	59.2	38	0.21	+59.8	59.0	39	32.5	+59.9	59.9	40	0.17	+60.0	60.5	41	0.00	+60.0	62.0	<b>40</b>
37	3																													

63°, 297° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.		
Dec.	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Dec.		
0	3 10.3 +59.6 116.8	2 43.2 +59.7 116.9	2 16.1 +59.8 116.9	1 48.9 +59.9 116.9	1 21.7 +59.9 117.0	0 54.5 +59.9 117.0	0 27.2 +60.0 117.0	0 00.0 +60.0 117.0	0	8 08.5 +59.6 116.3	7 41.9 +59.7 116.4	7 15.1 +59.8 116.5	6 48.3 +59.9 116.6	6 21.4 +59.9 116.7	5 54.3 +60.0 116.8	5 27.2 +60.0 116.9	5 00.0 +60.0 117.0	5	9 08.1 +59.7 116.2	8 41.6 +59.7 116.3	8 15.0 +59.8 116.4	7 48.2 +59.9 116.5	7 21.3 +59.9 116.7	6 54.3 +60.0 116.8	6 27.2 +60.0 116.9	6 00.0 +60.0 117.0	6
1	4 09.9 +59.7 116.7	3 42.9 +59.8 116.8	3 15.9 +59.8 116.8	2 48.8 +59.9 116.9	2 21.6 +60.0 116.9	1 54.4 +60.0 117.0	1 27.2 +60.0 117.0	1 00.0 +60.0 117.0	1	5 09.6 +59.6 116.6	4 42.7 +59.7 116.7	4 15.7 +59.8 116.8	3 48.7 +59.8 116.8	3 21.6 +59.9 116.9	2 54.4 +60.0 116.9	2 27.2 +60.0 117.0	2 00.0 +60.0 117.0	2	6 09.2 +59.7 116.5	5 42.4 +59.7 116.6	5 15.5 +59.8 116.7	4 48.5 +59.9 116.8	4 21.5 +59.9 116.9	3 54.4 +60.0 116.9	3 27.2 +60.0 116.9	3 00.0 +60.0 117.0	3
2	7 08.9 +59.6 116.4	6 42.1 +59.8 116.5	6 15.3 +59.8 116.6	5 48.4 +59.9 116.7	5 21.4 +60.0 116.8	4 54.4 +59.9 116.9	4 27.2 +60.0 116.9	4 00.0 +60.0 117.0	4	8 08.5 +59.6 116.3	7 41.9 +59.7 116.4	7 15.1 +59.8 116.5	6 48.3 +59.9 116.6	6 21.4 +59.9 116.7	5 54.3 +60.0 116.8	5 27.2 +60.0 116.9	5 00.0 +60.0 117.0	5	9 08.1 +59.7 116.2	8 41.6 +59.7 116.3	8 15.0 +59.8 116.4	7 48.2 +59.9 116.5	7 21.3 +59.9 116.7	6 54.3 +60.0 116.8	6 27.2 +60.0 116.9	6 00.0 +60.0 117.0	6
7	10 07.8 +59.6 116.1	9 41.3 +59.8 116.2	9 14.8 +59.8 116.4	8 48.1 +59.8 116.5	8 21.2 +60.0 116.6	7 54.3 +59.9 116.8	7 27.2 +60.0 116.9	7 00.0 +60.0 117.0	7	8 11.0 +59.6 115.9	10 41.1 +59.7 116.1	10 14.6 +59.8 116.3	9 47.9 +59.9 116.4	9 21.2 +59.9 116.6	8 54.2 +60.0 116.7	8 27.2 +60.0 116.9	8 00.0 +60.0 117.0	8	12 07.0 +59.7 115.8	11 40.8 +59.7 116.0	11 14.4 +59.8 116.2	10 47.8 +59.9 116.4	10 21.1 +59.9 116.5	9 54.2 +60.0 116.7	9 27.2 +60.0 116.9	9 00.0 +60.0 117.0	9
10	13 06.7 +59.6 115.7	12 40.5 +59.8 115.9	12 14.2 +59.8 116.1	11 47.7 +59.9 116.3	11 21.0 +60.0 116.5	10 54.2 +59.9 116.7	10 27.2 +60.0 116.8	10 00.0 +60.0 117.0	10	14 06.3 +59.6 115.6	13 40.3 +59.7 115.8	13 14.0 +59.8 116.0	12 47.6 +59.9 116.2	12 21.0 +59.9 116.4	11 54.1 +60.0 116.6	11 27.2 +59.9 116.8	11 00.0 +60.0 117.0	11	15 05.9 +59.6 115.5	14 40.0 +59.7 115.7	14 13.8 +59.8 116.0	13 47.5 +59.8 116.2	13 20.9 +59.9 116.4	12 54.1 +60.0 116.6	12 27.1 +60.0 116.8	12 00.0 +60.0 117.0	12
14	17 05.1 +59.7 115.2	16 39.4 +59.7 115.5	16 13.4 +59.8 115.8	15 47.2 +59.9 116.0	15 20.8 +60.0 116.3	14 54.1 +59.9 116.5	14 27.1 +60.0 116.8	14 00.0 +60.0 117.0	14	18 04.8 +59.6 115.1	17 39.1 +59.7 115.4	17 13.2 +59.8 115.7	16 47.1 +59.9 116.0	16 20.7 +59.9 116.2	15 54.0 +60.0 116.5	15 27.1 +60.0 116.8	15 00.0 +60.0 117.0	15	19 04.4 +59.6 115.0	18 38.8 +59.8 115.3	18 13.0 +59.8 115.6	17 47.0 +59.8 115.9	17 20.6 +59.9 116.2	16 54.0 +60.0 116.5	16 27.1 +60.0 116.7	16 00.0 +60.0 117.0	16
17	20 04.0 +59.6 114.9	19 38.6 +59.7 115.2	19 12.8 +59.8 115.5	18 46.8 +59.9 115.8	18 20.5 +60.0 116.1	17 54.0 +59.9 116.4	17 27.1 +60.0 116.7	17 00.0 +60.0 117.0	17	21 03.6 +59.5 114.8	20 38.3 +59.7 115.1	20 12.6 +59.8 115.4	19 46.7 +59.9 115.8	19 20.5 +59.9 116.1	18 53.9 +60.0 116.4	18 27.1 +60.0 116.7	18 00.0 +60.0 117.0	18	22 03.1 +59.6 114.6	21 38.0 +59.7 115.0	21 12.4 +59.8 115.4	20 46.6 +59.8 115.7	20 20.4 +59.9 116.0	19 53.9 +60.0 116.4	19 27.1 +60.0 116.7	19 00.0 +60.0 117.0	19
20	23 02.7 +59.6 114.5	22 37.7 +59.6 114.9	22 12.2 +59.8 115.3	21 46.4 +59.9 115.6	21 20.3 +59.9 116.0	20 53.9 +59.9 116.3	20 27.1 +60.0 116.7	20 00.0 +60.0 117.0	20	24 02.3 +59.6 114.4	23 37.3 +59.7 114.8	23 12.0 +59.8 115.2	22 46.3 +59.9 115.6	22 20.2 +60.0 115.9	21 53.8 +60.0 116.3	21 27.1 +60.0 116.7	21 00.0 +60.0 117.0	21	25 01.9 +59.5 114.2	24 37.0 +59.7 114.7	24 11.8 +59.8 115.1	23 46.2 +59.8 115.5	23 20.2 +59.9 115.9	22 53.8 +60.0 116.3	22 27.1 +60.0 116.6	22 00.0 +60.0 117.0	22
24	27 01.0 +59.5 114.0	26 36.4 +59.7 114.4	26 11.3 +59.8 114.9	25 45.9 +59.8 115.3	25 20.0 +59.9 115.8	24 53.7 +60.0 116.2	24 27.1 +60.0 116.6	24 00.0 +60.0 117.0	24	28 00.5 +59.6 113.8	27 36.1 +59.6 114.3	27 11.1 +59.8 114.8	26 45.7 +59.9 115.3	26 19.9 +59.9 115.7	25 53.7 +60.0 116.1	25 27.0 +60.0 116.6	25 00.0 +60.0 117.0	25	29 00.1 +59.5 113.7	28 35.7 +59.7 114.2	28 10.9 +59.8 114.7	27 45.6 +59.8 115.2	27 18.6 +59.8 115.6	26 53.7 +59.9 116.1	26 27.0 +60.0 116.6	26 00.0 +60.0 117.0	26
29	30 59.1 +59.6 113.4	30 35.0 +59.7 114.0	30 10.4 +59.8 114.5	29 45.3 +59.8 115.0	29 19.7 +59.9 115.5	28 53.6 +59.9 116.0	28 27.0 +60.0 116.5	28 00.0 +60.0 117.0	28	31 58.7 +59.5 113.3	31 34.7 +59.6 113.8	31 10.2 +59.7 114.4	30 45.1 +59.9 114.9	30 19.6 +59.9 115.5	29 53.5 +60.0 116.0	29 27.0 +60.0 116.5	29 00.0 +60.0 117.0	29	32 58.2 +59.4 113.1	32 34.3 +59.6 113.7	32 09.9 +59.8 114.3	31 45.0 +59.8 114.8	31 19.5 +59.9 115.4	30 53.5 +60.0 115.9	30 27.0 +60.0 116.5	30 00.0 +60.0 117.0	30
33	33 57.6 +59.5 113.0	33 33.9 +59.7 113.6	33 09.7 +59.7 114.2	32 44.8 +59.8 114.8	32 19.4 +59.9 115.3	31 53.5 +59.9 115.9	31 27.0 +60.0 116.5	31 00.0 +60.0 117.0	31	34 57.1 +59.5 112.8	34 33.6 +59.6 113.4	34 09.4 +59.7 114.1	33 44.6 +59.9 114.7	33 19.3 +59.9 115.3	32 53.4 +60.0 115.9	32 27.0 +60.0 116.4	32 00.0 +60.0 117.0	32	35 56.6 +59.4 112.6	35 33.2 +59.6 113.3	35 09.1 +59.8 113.9	34 44.5 +59.8 114.6	34 19.2 +59.9 115.2	33 53.4 +59.9 115.8	33 27.0 +60.0 116.4	33 00.0 +60.0 117.0	33
34	36 56.0 +59.5 112.5	36 32.8 +59.6 113.2	36 08.9 +59.7 113.8	35 44.3 +59.8 114.5	35 19.1 +59.9 115.1	34 53.3 +60.0 115.8	34 27.0 +60.0 116.5	34 00.0 +60.0 117.0	34	37 55.5 +59.4 112.3	37 32.4 +59.5 113.0	37 08.6 +59.7 113.7	36 44.1 +59.8 114.4	36 19.0 +59.9 115.1	35 53.3 +59.9 115.7	35 26.9 +60.0 116.4	35 00.0 +60.0 117.0	35	38 54.9 +59.4 112.1	38 31.9 +59.6 112.9	38 08.3 +59.7 113.6	37 43.9 +59.9 114.3	37 18.9 +59.9 115.0	36 53.2 +60.0 115.7	36 26.9 +60.0 116.3	36 00.0 +60.0 117.0	36
35	39 54.3 +59.4 111.9	39 31.5 +59.6 112.7	39 08.0 +59.7 113.5	38 43.8 +59.8 114.2	38 18.8 +59.9 114.9	37 53.6 +60.0 116.5	37 26.9 +60.0 116.3	37 00.0 +60.0 117.0	37	40 53.7 +59.4 111.7	40 31.1 +59.5 112.5	40 07.7 +59.7 113.3	39 43.6 +59.8 114.1	39 18.7 +59.9 114.8	38 53.2 +59.9 115.6	38 26.9 +60.0 116.3	38 00.0 +60.0 117.0	38	41 53.1 +59.3 111.6	41 30.6 +59.5 112.4	41 07.4 +59.6 113.2	40 43.4 +59.8 114.0	40 18.6 +59.9 114.8	39 53.1 +60.0 115.5	39 26.9 +60.0 116.3	39 00.0 +60.0 117.0	39
40	42 52.4 +59.3 111.4	42 30.1 +59.5 112.2	42 07.0 +59.7 113.1	41 43.2 +59.7 113.9	41 18.5 +59.9 114.7	40 53.1 +59.9 115.5	40 26.9 +60.0 116.2	40 00.0 +60.0 117.0	40	43 51.7 +59.3 111.1	43 29.6 +59.5 112.0	43 06.7 +59.7 112.9	42 42.9 +59.8 113.8	42 18.4 +59.8 114.6	41 53.0 +60.0 115.4	41 26.9 +60.0 116.2	41 00.0 +60.0 117.0	41	44 51.0 +59.3 110.9	44 29.1 +59.5 111.9	44 06.4 +59.6 112.8	43 42.7 +59.8 113.6	43 18.2 +59.9 114.5	42 53.0 +59.9 115.4	42 26.9 +60.0 116.7	42 00.0 +60.0 117.0	42
43	45 50.3 +59.3 110.7	45 28.6 +59.5 111.7	45 06.0 +59.6 112.6	44 42.5 +59.8 113.5	44 18.1 +59.9 114.4	43 52.9 +59.9 115.3	43 26.8 +60.0 116.2	43 00.0 +60.0 117.0	43	46 49.6 +59.2 110.5	46 28.1 +59.4 111.5	46 05.6 +59.7 112.4	45 42.3 +59.7 113.4	45 18.0 +59.9 114.3	44 52.8 +60.0 115.2	44 26.8 +60.0 116.1	44 00.0 +60.0 117.0	44	47 48.8 +59.2 110.3	47 27.5 +59.4 111.3	47 05.3 +59.6 112.3	46 42.0 +59.8 113.3	46 17.9 +59.8 114.2	45 52.8 +59.9 115.2	45 26.8 +60.0 116.1	45 00.0 +60.0 117.0	45
46	48 48.0 +59.1 110.0	48 26.9 +59.4 111.1	48 04.9 +59.5 112.1	47 41.8 +59.7 113.1	47 17.7 +59.9 114.1	46 52.7 +60.0 115.1	46 26.8 +60.0 116.1	46 00.0 +60.0 117.0	46	47 49.1 +59.2 109.8	49 26.3 +59.4 110.9	49 04.4 +59.6 111.9	48 41.5 +59.7 113.0	48 17.6 +59.8 114.0	47 52.7 +59.9 115.0	47 26.8 +60.0 116.0	47 00.0 +60.0 117.0	47	48 50.6 +59.1 109.5	50 25.7 +59.3 110.6	50 04.0 +59.6 111.7	49 41.2 +59.8 112.8	49 17.4 +59.9 113.9	48 52.6 +59.9 115.0	48 26.8 +60.0 116.0	48 00.0 +60.0 117.0	48
49	51 45.4 +59.0 109.2	51 25.0 +59.3 110.4	51 03.6 +59.5 111.6	50 41.0 +59.7 112.7	50 17.3 +59.8 113.8	49 52.5 +60.0 114.9	49 26.8 +60.0 116.0	49 00.0 +60.0 117.0	49	52 44.4 +59.0 108.9	52 24.3 +59.3 110.1	52 03.1 +59.5 111.4	51 40.7 +59.7 112.5	51 17.1 +59.8 113.7	50 52.5 +59.9 114.8	50 26.7 +60.0 115.9	50 00.0 +60.0 117.0	50	53 43.4 +59.0 108.6	53 23.6 +59.3 109.9	53 02.6 +59.5 111.1	52 40.4 +59.6					

**LATITUDE CONTRARY NAME TO DECLINATION**

**L.H.A. 63°, 297°**

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.					
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z						
0	3	10.3	-59.6	116.8	2	43.2	-59.7	116.9	2	16.1	-59.9	116.9	1	48.9	-59.9	116.9	1	21.7	-59.9	117.0	0	54.5	-60.0	117.0	0	0.00	+60.0	63.0	0	
1	2	10.7	-59.7	116.9	1	43.5	-59.8	117.0	1	16.2	-59.8	117.0	0	49.0	-59.9	117.0	0	21.8	-60.0	117.0	0	0.55	+60.0	63.0	0	1	0.00	+60.0	63.0	1
2	1	11.0	-59.6	117.0	0	43.7	-59.7	117.1	0	16.4	-59.8	117.1	0	10.9	+59.9	62.9	0	38.2	+59.9	62.9	1	0.55	+59.9	63.0	1	2	0.00	+60.0	63.0	2
3	0	11.4	-59.7	117.2	0	16.0	+59.8	62.8	0	43.4	+59.8	62.9	1	10.8	+59.8	62.9	1	38.1	+60.0	62.9	2	0.54	+60.0	63.0	3	3	0.00	+60.0	63.0	3
4	0	48.3	+59.6	62.7	1	15.8	+59.7	62.8	1	43.2	+59.8	62.8	2	10.6	+59.9	62.8	2	38.1	+59.9	62.8	3	0.54	+60.0	62.9	4	4	0.00	+60.0	63.0	4
5	1	47.9	+59.7	62.6	2	15.5	+59.7	62.7	2	43.0	+59.9	62.7	3	10.5	+59.9	62.8	3	38.0	+59.9	62.8	4	0.54	+60.0	62.9	5	5	0.00	+60.0	63.0	5
6	2	47.6	+59.6	62.5	3	15.2	+59.8	62.6	3	42.9	+59.8	62.6	4	10.4	+59.9	62.7	4	37.9	+60.0	62.8	5	0.54	+59.9	62.8	6	6	0.00	+60.0	63.0	6
7	3	47.2	+59.7	62.4	4	15.0	+59.7	62.5	4	42.7	+59.8	62.5	5	10.3	+59.9	62.6	5	37.9	+59.9	62.7	6	0.53	+60.0	62.8	7	7	0.00	+60.0	63.0	7
8	4	46.9	+59.6	62.3	5	14.7	+59.7	62.4	5	42.5	+59.8	62.5	6	10.2	+59.9	62.6	6	37.8	+59.9	62.7	7	0.53	+60.0	62.9	8	8	0.00	+60.0	63.0	8
9	5	46.5	+59.6	62.2	6	14.4	+59.8	62.3	6	42.3	+59.8	62.4	7	10.1	+59.8	62.5	7	37.7	+60.0	62.6	8	0.53	+59.9	62.7	9	9	0.00	+60.0	63.0	9
10	6	46.1	+59.7	62.1	7	14.2	+59.7	62.2	7	42.1	+59.8	62.3	8	0.9	+59.9	62.4	8	37.7	+59.9	62.6	9	0.52	+60.0	62.7	9	9	32.7	+60.0	62.8	10
11	7	45.8	+59.6	62.0	8	13.9	+59.7	62.1	8	41.9	+59.8	62.2	9	0.8	+59.9	62.4	9	37.6	+59.9	62.5	10	0.52	+60.0	62.7	10	10	32.7	+60.0	62.8	11
12	8	45.4	+59.7	61.9	9	13.6	+59.8	62.0	9	41.7	+59.9	62.1	10	0.9	+59.9	62.3	10	37.5	+60.0	62.5	11	0.52	+59.9	62.6	11	12	0.00	+60.0	63.0	12
13	9	45.1	+59.6	61.8	10	13.4	+59.7	61.9	10	41.6	+59.8	62.1	11	0.9	+59.9	62.2	11	37.5	+59.9	62.4	12	0.51	+60.0	62.6	12	13	32.7	+60.0	62.8	13
14	10	44.7	+59.6	61.6	11	13.1	+59.7	61.8	11	41.4	+59.8	62.0	12	0.9	+59.9	62.2	12	37.4	+59.9	62.4	13	0.51	+60.0	62.6	13	14	0.00	+60.0	63.0	14
15	11	44.3	+59.6	61.5	12	12.8	+59.8	61.7	12	41.2	+59.8	61.9	13	0.9	+59.9	62.1	13	37.3	+59.9	62.3	14	0.51	+60.0	62.5	14	15	32.7	+59.9	62.8	15
16	12	43.9	+59.7	61.4	13	12.6	+59.7	61.6	13	41.0	+59.8	61.8	14	0.9	+59.9	62.0	14	37.2	+60.0	62.3	15	0.51	+59.9	62.5	15	16	32.6	+60.0	62.7	16
17	13	43.6	+59.6	61.3	14	12.3	+59.7	61.5	14	40.8	+59.8	61.7	15	0.9	+59.9	62.0	15	37.2	+59.9	62.2	16	0.50	+60.0	62.5	16	17	32.6	+60.0	63.0	17
18	14	43.2	+59.6	61.2	15	12.0	+59.7	61.4	15	40.6	+59.8	61.7	16	0.9	+59.8	61.9	16	37.1	+59.9	62.2	17	0.50	+60.0	62.4	17	18	32.6	+60.0	63.0	18
19	15	42.8	+59.6	61.1	16	11.7	+59.7	61.3	16	40.4	+59.8	61.6	17	0.8	+59.9	61.8	17	37.0	+60.0	62.1	18	0.50	+59.9	62.4	18	19	32.6	+60.0	63.0	19
20	16	42.4	+59.6	60.9	17	11.4	+59.8	61.2	17	40.2	+59.8	61.5	18	0.8	+59.9	61.8	18	37.0	+59.9	62.1	19	0.49	+60.0	62.4	19	20	32.6	+60.0	63.0	20
21	17	42.0	+59.6	60.8	18	11.2	+59.7	61.1	18	40.0	+59.8	61.4	19	0.8	+59.9	61.7	19	36.9	+59.9	62.0	20	0.49	+60.0	62.3	20	21	32.6	+60.0	63.0	21
22	18	41.6	+59.6	60.7	19	10.9	+59.7	61.0	19	39.8	+59.8	61.3	20	0.8	+59.8	61.6	20	36.8	+59.9	62.0	21	0.49	+59.9	62.3	21	22	32.6	+60.0	63.0	22
23	19	41.2	+59.6	60.6	20	10.6	+59.7	60.9	20	39.6	+59.8	61.2	21	0.8	+59.9	61.6	21	36.7	+60.0	61.9	22	0.48	+60.0	62.3	22	23	32.6	+60.0	63.0	23
24	20	40.8	+59.6	60.5	21	10.3	+59.7	60.8	21	39.4	+59.8	61.1	22	0.8	+59.9	61.5	22	36.7	+59.9	61.9	23	0.48	+60.0	62.2	23	24	32.6	+60.0	63.0	24
25	21	40.4	+59.6	60.3	22	10.0	+59.7	60.7	22	39.2	+59.8	61.0	23	0.8	+59.8	61.4	23	36.6	+59.9	61.8	24	0.48	+59.9	62.2	24	25	32.6	+60.0	63.0	25
26	22	40.0	+59.6	60.2	23	0.9	+59.7	60.6	23	39.0	+59.7	61.0	24	0.7	+59.9	61.3	24	36.5	+59.9	61.7	25	0.47	+60.0	62.2	25	26	32.6	+60.0	63.0	26
27	23	39.6	+59.6	60.1	24	0.94	+59.6	60.5	24	38.7	+59.8	60.9	25	0.78	+59.8	61.3	25	36.4	+59.9	61.7	26	0.47	+60.0	62.4	26	27	32.6	+59.9	62.6	27
28	24	39.2	+59.5	60.0	25	0.90	+59.7	60.4	25	38.5	+59.8	60.8	26	0.76	+59.9	61.2	26	36.3	+60.0	61.6	27	0.47	+60.0	62.5	27	28	32.5	+60.0	63.0	28
29	25	38.7	+59.6	59.8	26	0.87	+59.7	60.2	26	38.3	+59.8	60.7	27	0.75	+59.8	61.1	27	36.3	+59.9	61.6	28	0.46	+60.0	62.0	28	29	32.5	+60.0	63.0	29
30	26	38.3	+59.6	59.7	27	0.84	+59.7	60.1	27	38.1	+59.7	60.6	28	0.73	+59.9	61.0	28	36.2	+59.9	61.5	29	0.46	+59.9	62.0	29	30	32.5	+60.0	63.0	30
31	27	37.9	+59.5	59.5	28	0.81	+59.6	60.0	28	37.8	+59.8	60.5	29	0.72	+59.8	61.0	29	36.1	+59.9	61.4	30	0.45	+60.0	62.0	30	31	32.5	+60.0	63.0	31
32	28	37.4	+59.5	59.4	29	0.79	+59.7	59.9	29	37.6	+59.8	60.4	30	0.70	+59.9	60.9	30	36.0	+59.9	61.4	31	0.45	+60.0	62.4	31	32	32.5	+60.0	63.0	32
33	29	36.9	+59.6	59.3	30	0.74	+59.6	59.8	30	37.4	+59.7	60.3	31	0.69	+59.8	60.8	31	35.9	+59.9	61.3	32	0.45	+59.9	61.9	32	33	32.5	+60.0	63.0	33
34	30	36.5	+59.5	59.1	31	0.70	+59.7	59.6	31	37.1	+59.8	60.2	32	0.67	+59.9	60.7	32	35.8	+59.9	61.3	33	0.44	+60.0	62.4	33	34	32.5	+60.0	63.0	34
35	31	36.0	+59.5	59.0	32	0.67	+59.6	59.5	32	36.9	+59.7	60.1	33	0.57	+59.9	61.2	34	0.44	+59.9	61.8	35	0.35	+60.0	62.4	35	36	32.5	+60.0	63.0	35
36	32	35.5	+59.5	58.8	33	0.63	+59.6	59.4	33	36.6	+59.8	60.6	34	0.46	+59.8	60.5	34	35.6	+59.9	61.1	35	0.43	+60.0	62.4	36	37	32.5	+60.0	63.0	36
37	33	35.0	+59.5	58.7	34	0.59	+59.6	59.2	34	36.3	+59.8	59.8	35	0.62</td																

64°, 296° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
Dec.	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	H	c	d	Z	Dec.
0	3 03.7	+59.7	115.8	2 37.6	+59.7	115.9	2 11.4	+59.8	115.9	1 45.1	+59.9	115.9	1 18.9	+59.9	116.0	0 52.6	+60.0	116.0	0 26.3	+60.0	116.0	0 00.0	+60.0	116.0	0
1	4 03.4	+59.6	115.7	3 37.3	+59.7	115.8	3 11.2	+59.8	115.8	2 45.0	+59.9	115.9	2 18.8	+59.9	115.9	1 52.6	+59.9	116.0	1 26.3	+60.0	116.0	1 00.0	+60.0	116.0	1
2	5 03.0	+59.7	115.6	4 37.0	+59.8	115.7	4 11.0	+59.8	115.8	3 44.9	+59.9	115.8	3 18.7	+60.0	115.9	2 52.5	+60.0	115.9	2 26.3	+60.0	116.0	2 00.0	+60.0	116.0	2
3	6 02.7	+59.6	115.5	5 36.8	+59.7	115.6	5 10.8	+59.8	115.7	4 44.8	+59.9	115.8	4 18.7	+59.9	115.8	3 52.5	+60.0	115.9	3 26.3	+60.0	116.0	3 00.0	+60.0	116.0	3
4	7 02.3	+59.6	115.4	6 36.5	+59.7	115.5	6 10.6	+59.8	115.6	5 44.7	+59.8	115.7	5 18.6	+59.9	115.8	4 52.5	+59.9	115.9	4 26.3	+60.0	115.9	4 00.0	+60.0	116.0	4
5	8 01.9	+59.7	115.3	7 36.2	+59.8	115.4	7 10.4	+59.9	115.5	6 44.5	+59.9	115.6	6 18.5	+60.0	115.7	5 52.4	+60.0	115.8	5 26.3	+60.0	115.9	5 00.0	+60.0	116.0	5
6	9 01.6	+59.6	115.2	8 36.0	+59.7	115.3	8 10.3	+59.8	115.4	7 44.4	+59.9	115.6	7 18.5	+59.9	115.7	6 52.4	+60.0	115.8	6 26.3	+59.9	115.9	6 00.0	+60.0	116.0	6
7	10 01.2	+59.6	115.1	9 35.7	+59.7	115.2	9 10.1	+59.8	115.4	8 44.3	+59.9	115.5	8 18.4	+59.9	115.6	7 52.4	+60.0	115.8	7 26.2	+60.0	115.9	7 00.0	+60.0	116.0	7
8	11 00.8	+59.6	114.9	10 35.4	+59.7	115.1	10 09.9	+59.8	115.3	9 44.2	+59.9	115.4	9 18.3	+60.0	115.6	8 52.4	+59.9	115.7	8 26.2	+60.0	115.9	8 00.0	+60.0	116.0	8
9	12 00.4	+59.7	114.8	11 35.1	+59.8	115.0	11 09.7	+59.8	115.2	10 44.1	+59.8	115.4	10 18.3	+59.9	115.5	9 52.3	+60.0	115.7	9 26.2	+60.0	115.9	9 00.0	+60.0	116.0	9
10	13 00.1	+59.6	114.7	12 34.9	+59.7	114.9	12 09.5	+59.8	115.1	11 43.9	+59.9	115.3	11 18.2	+59.9	115.5	10 52.3	+60.0	115.7	10 26.2	+60.0	115.8	10 00.0	+60.0	116.0	10
11	13 59.7	+59.6	114.6	13 34.6	+59.7	114.8	13 09.3	+59.8	115.0	12 43.8	+59.9	115.2	12 18.1	+60.0	115.4	11 52.3	+59.9	115.6	11 26.2	+60.0	115.8	11 00.0	+60.0	116.0	11
12	14 59.3	+59.6	114.5	14 34.3	+59.7	114.7	14 09.1	+59.8	115.0	13 43.7	+59.9	115.2	13 18.1	+59.9	115.4	12 52.2	+60.0	115.6	12 26.2	+60.0	115.8	12 00.0	+60.0	116.0	12
13	15 58.9	+59.6	114.4	15 34.0	+59.7	114.6	15 08.9	+59.8	114.9	14 43.6	+59.8	115.1	14 18.0	+59.9	115.3	13 52.2	+60.0	115.6	13 26.2	+60.0	115.8	13 00.0	+60.0	116.0	13
14	16 58.5	+59.6	114.2	16 33.7	+59.7	114.5	16 08.7	+59.8	114.8	15 43.4	+59.9	115.0	15 17.9	+60.0	115.3	14 52.2	+59.9	115.5	14 26.2	+60.0	115.8	14 00.0	+60.0	116.0	14
15	17 58.1	+59.6	114.1	17 33.4	+59.8	114.4	17 08.5	+59.9	114.7	16 43.3	+59.9	115.0	16 17.9	+59.9	115.2	15 52.1	+60.0	115.5	15 26.2	+60.0	115.8	15 00.0	+60.0	116.0	15
16	18 57.7	+59.6	114.0	18 33.2	+59.7	114.3	18 08.3	+59.8	114.6	17 43.2	+59.9	114.9	17 17.8	+59.9	115.2	16 52.1	+60.0	115.5	16 26.2	+60.0	115.7	16 00.0	+60.0	116.0	16
17	19 57.3	+59.6	113.9	19 32.9	+59.7	114.2	19 08.1	+59.8	114.5	18 43.1	+59.8	114.8	18 17.7	+59.9	115.1	17 52.1	+59.9	115.4	17 26.2	+60.0	115.7	17 00.0	+60.0	116.0	17
18	20 56.9	+59.6	113.8	20 32.6	+59.7	114.1	20 07.9	+59.8	114.4	19 42.9	+59.9	114.8	19 17.6	+60.0	115.1	18 52.0	+60.0	115.4	18 26.2	+60.0	115.7	18 00.0	+60.0	116.0	18
19	21 56.5	+59.5	113.6	21 32.3	+59.6	114.0	21 07.7	+59.8	114.3	20 42.8	+59.8	114.7	20 17.6	+59.9	115.0	19 52.0	+60.0	115.4	19 26.2	+59.9	115.7	19 00.0	+60.0	116.0	19
20	22 56.0	+59.6	113.5	22 31.9	+59.7	113.9	22 07.5	+59.8	114.3	21 42.6	+59.9	114.6	21 17.5	+59.9	115.0	20 52.0	+59.9	115.3	20 26.1	+60.0	115.7	20 00.0	+60.0	116.0	20
21	23 55.6	+59.6	113.4	23 31.6	+59.7	113.8	23 07.3	+59.7	114.2	22 42.5	+59.9	114.5	22 17.4	+59.9	114.9	21 51.9	+60.0	115.3	21 26.1	+60.0	115.7	21 00.0	+60.0	116.0	21
22	24 55.2	+59.5	113.2	24 31.3	+59.7	113.7	24 07.0	+59.8	114.1	23 42.4	+59.8	114.5	23 17.3	+59.9	114.9	22 51.9	+60.0	115.3	22 26.1	+60.0	115.6	22 00.0	+60.0	116.0	22
23	25 54.7	+59.6	113.1	25 31.0	+59.7	113.5	25 06.8	+59.8	114.0	24 42.2	+59.9	114.4	24 17.2	+60.0	114.8	23 51.9	+59.9	115.2	23 26.1	+60.0	115.6	23 00.0	+60.0	116.0	23
24	26 54.3	+59.5	113.0	26 30.7	+59.6	113.4	26 06.6	+59.8	113.9	25 42.1	+59.8	114.3	25 17.2	+59.9	114.8	24 51.8	+60.0	115.2	24 26.1	+60.0	115.6	24 00.0	+60.0	116.0	24
25	27 53.8	+59.6	112.8	27 30.3	+59.7	113.3	27 06.4	+59.7	113.8	26 41.9	+59.9	114.2	26 17.1	+59.9	114.7	25 51.8	+60.0	115.1	25 26.1	+60.0	115.6	25 00.0	+60.0	116.0	25
26	28 53.4	+59.5	112.7	28 30.0	+59.6	113.2	28 06.1	+59.8	113.7	27 41.8	+59.8	114.2	27 17.0	+59.9	114.6	26 51.8	+59.9	115.1	26 26.1	+60.0	115.6	26 00.0	+60.0	116.0	26
27	29 52.9	+59.5	112.5	29 29.6	+59.7	113.1	29 05.9	+59.7	113.6	28 41.6	+59.9	114.1	28 16.9	+59.9	114.6	27 51.7	+60.0	115.1	27 26.1	+60.0	115.5	27 00.0	+60.0	116.0	27
28	30 52.4	+59.5	112.4	30 29.3	+59.6	112.9	30 05.6	+59.8	113.5	29 41.5	+59.8	114.0	29 16.8	+59.9	114.5	28 51.7	+60.0	115.0	28 26.1	+60.0	115.5	28 00.0	+60.0	116.0	28
29	31 51.9	+59.5	112.2	31 28.9	+59.7	112.8	31 05.4	+59.7	113.4	30 41.3	+59.9	113.9	30 16.7	+60.0	114.5	29 51.7	+59.9	115.0	29 26.1	+60.0	115.5	29 00.0	+60.0	116.0	29
30	32 51.4	+59.5	112.1	32 28.6	+59.6	112.7	32 05.1	+59.8	113.3	31 41.2	+59.8	113.8	31 16.7	+59.9	114.4	30 51.6	+60.0	114.9	30 26.1	+59.9	115.5	30 00.0	+60.0	116.0	30
31	33 50.9	+59.5	111.9	33 28.2	+59.6	112.5	33 04.9	+59.7	113.2	32 41.0	+59.8	113.7	32 16.6	+59.9	114.3	31 51.6	+59.9	114.9	31 26.0	+60.0	115.5	31 00.0	+60.0	116.0	31
32	34 50.4	+59.4	111.8	34 27.8	+59.6	112.4	34 04.6	+59.7	113.0	33 40.8	+59.9	113.7	33 16.5	+59.9	114.3	32 51.5	+60.0	114.9	32 26.0	+60.0	115.4	32 00.0	+60.0	116.0	32
33	35 49.8	+59.5	111.6	35 27.4	+59.6	112.3	35 04.3	+59.8	112.9	34 40.7	+59.8	113.6	34 16.4	+59.9	114.2	33 51.5	+59.9	114.8	33 26.0	+60.0	115.4	33 00.0	+60.0	116.0	33
34	36 49.3	+59.4	111.4	36 27.0	+59.6	112.1	36 04.1	+59.7	112.8	35 40.5	+59.8	113.5	35 16.3	+59.9	114.1	34 51.4	+60.0	114.4	34 26.0	+60.0	115.0	34 00.0	+60.0	116.0	34
35	37 48.7	+59.4	111.3	37 26.6	+59.5	112.0	37 03.8	+59.7	112.7	36 40.3	+59.8	113.4	36 16.2	+59.9	114.1	35 51.4	+60.0	114.7	35 26.0	+60.0	115.4	35 00.0	+60.0	116.0	35
36	38 48.1	+59.4	111.1	38 26.1	+59.6	111.8	38 03.5	+59.7	112.6	37 40.1	+59.8	113.3	37 16.1	+59.9	114.0	36 51.4	+59.9	114.7	36 26.0	+60.0	115.3	36 00.0	+60.0</td		

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $64^\circ$ ,  $296^\circ$

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
	Hc	d	Z	Hc	d	Z																			
0	3 03.7 -59.6	115.8		2 37.6 -59.8	115.9		2 11.4 -59.8	115.9		1 45.1 -59.8	115.9		1 18.9 -60.0	116.0		0 52.6 -60.0	116.0		0 26.3 -60.0	116.0		0 00.0 +60.0	64.0		0
1	2 04.1 -59.6	115.9		1 37.8 -59.7	116.0		1 11.6 -59.9	116.0		0 45.3 -59.9	116.0		0 18.9 -59.9	116.0		0 07.4 +59.9	64.0		0 33.7 +60.0	64.0		1 00.0 +60.0	64.0		1
2	1 04.5 -59.7	116.1		0 38.1 -59.7	116.1		0 11.7 -59.8	116.1		0 14.6 +59.8	63.9		0 41.0 +59.9	63.9		1 07.3 +60.0	64.0		1 33.7 +60.0	64.0		2 00.0 +60.0	64.0		2
3	0 04.8 -59.6	116.2		0 21.6 +59.8	63.8		0 48.1 +59.8	63.9		1 14.5 +59.9	63.9		1 40.9 +60.0	63.9		2 07.3 +60.0	63.9		2 33.7 +60.0	64.0		3 00.0 +60.0	64.0		3
4	0 54.8 +59.6	63.7		1 21.4 +59.7	63.7		1 47.9 +59.8	63.8		2 14.4 +59.9	63.8		2 40.9 +59.9	63.8		3 07.3 +60.0	63.9		3 33.7 +60.0	63.9		4 00.0 +60.0	64.0		4
5	1 54.4 +59.7	63.6		2 21.1 +59.7	63.7		2 47.7 +59.8	63.7		3 14.3 +59.8	63.7		3 40.8 +59.9	63.8		4 07.3 +59.9	63.9		4 33.7 +60.0	63.9		5 00.0 +60.0	64.0		5
6	2 54.1 +59.6	63.5		3 20.8 +59.8	63.6		3 47.5 +59.8	63.6		4 14.2 +59.8	63.7		4 40.7 +60.0	63.7		5 07.2 +60.0	63.8		5 33.7 +59.9	63.9		6 00.0 +60.0	64.0		6
7	3 53.7 +59.7	63.4		4 20.6 +59.7	63.5		4 47.3 +59.8	63.5		5 14.0 +59.9	63.6		5 40.7 +59.9	63.7		6 07.2 +60.0	63.8		6 33.6 +60.0	63.9		7 00.0 +60.0	64.0		7
8	4 53.4 +59.6	63.3		5 20.3 +59.7	63.4		5 47.1 +59.9	63.5		6 13.9 +59.9	63.6		6 40.6 +59.9	63.7		7 07.2 +59.9	63.8		7 33.6 +60.0	63.9		8 00.0 +60.0	64.0		8
9	5 53.0 +59.6	63.2		6 20.0 +59.8	63.3		6 47.0 +59.8	63.4		7 13.8 +59.9	63.5		7 40.5 +60.0	63.6		8 07.1 +60.0	63.7		8 33.6 +60.0	63.9		9 00.0 +60.0	64.0		9
10	6 52.6 +59.7	63.1		7 19.8 +59.7	63.2		7 46.8 +59.8	63.3		8 13.7 +59.9	63.4		8 40.5 +59.9	63.6		9 07.1 +60.0	63.7		9 33.6 +60.0	63.8		10 00.0 +60.0	64.0		10
11	7 52.3 +59.6	63.0		8 19.5 +59.7	63.1		8 46.6 +59.8	63.2		9 13.6 +59.8	63.4		9 40.4 +59.9	63.5		10 07.1 +59.9	63.7		10 33.6 +60.0	63.8		11 00.0 +60.0	64.0		11
12	8 51.9 +59.6	62.8		9 19.2 +59.7	63.0		9 46.4 +59.8	63.1		10 13.4 +59.9	63.3		10 40.3 +59.9	63.5		11 07.0 +60.0	63.6		11 33.6 +60.0	63.8		12 00.0 +60.0	64.0		12
13	9 51.5 +59.7	62.7		10 18.9 +59.8	62.9		10 46.2 +59.8	63.1		11 13.3 +59.9	63.2		11 40.2 +60.0	63.4		12 07.0 +60.0	63.6		12 33.6 +60.0	63.8		13 00.0 +60.0	64.0		13
14	10 51.2 +59.6	62.6		11 18.7 +59.7	62.8		11 46.0 +59.8	63.0		12 13.2 +59.9	63.2		12 40.2 +59.9	63.4		13 07.0 +60.0	63.6		13 33.6 +60.0	63.8		14 00.0 +60.0	64.0		14
15	11 50.8 +59.6	62.5		12 18.4 +59.7	62.7		12 45.8 +59.8	62.9		13 13.1 +59.8	63.1		13 40.1 +59.9	63.3		14 07.0 +59.9	63.5		14 33.6 +60.0	63.8		15 00.0 +60.0	64.0		15
16	12 50.4 +59.6	62.4		13 18.1 +59.7	62.6		13 45.6 +59.8	62.8		14 12.9 +59.9	63.0		14 40.0 +60.0	63.3		15 06.9 +60.0	63.5		15 33.6 +60.0	63.7		16 00.0 +60.0	64.0		16
17	13 50.0 +59.6	62.3		14 17.8 +59.7	62.5		14 45.4 +59.8	62.7		15 12.8 +59.9	63.0		15 40.0 +59.9	63.2		16 06.9 +60.0	63.5		16 33.6 +60.0	63.7		17 00.0 +60.0	64.0		17
18	14 49.6 +59.6	62.2		15 17.5 +59.8	62.4		15 45.2 +59.8	62.6		16 12.7 +59.9	62.9		16 39.9 +59.9	63.2		17 06.9 +59.9	63.4		17 33.6 +60.0	63.7		18 00.0 +60.0	64.0		18
19	15 49.2 +59.7	62.0		16 17.3 +59.7	62.3		16 45.0 +59.8	62.6		17 12.6 +59.8	62.8		17 39.8 +59.9	63.1		18 06.8 +60.0	63.4		18 33.6 +59.9	63.7		19 00.0 +60.0	64.0		19
20	16 48.9 +59.6	61.9		17 17.0 +59.7	62.2		17 44.8 +59.8	62.5		18 12.4 +59.9	62.8		18 39.7 +60.0	63.1		19 06.8 +60.0	63.4		19 33.5 +60.0	63.7		20 00.0 +60.0	64.0		20
21	17 48.5 +59.6	61.8		18 16.7 +59.7	62.1		18 44.6 +59.8	62.4		19 12.3 +59.9	62.7		19 39.7 +59.9	63.0		20 06.8 +59.9	63.3		20 33.5 +60.0	63.7		21 00.0 +60.0	64.0		21
22	18 48.1 +59.5	61.7		19 16.4 +59.7	62.0		19 44.4 +59.8	62.3		20 12.2 +59.8	62.6		20 39.6 +59.9	63.0		21 06.7 +60.0	63.3		21 33.5 +60.0	63.6		22 00.0 +60.0	64.0		22
23	19 47.6 +59.6	61.6		20 16.1 +59.7	61.9		20 44.2 +59.8	62.2		21 12.0 +59.9	62.5		21 39.5 +59.9	62.9		22 06.7 +60.0	63.3		22 33.5 +60.0	63.6		23 00.0 +60.0	64.0		23
24	20 47.2 +59.6	61.4		21 15.8 +59.7	61.8		21 44.0 +59.8	62.1		22 11.9 +59.8	62.5		22 39.4 +60.0	62.8		23 06.7 +59.9	63.2		23 33.5 +60.0	63.6		24 00.0 +60.0	64.0		24
25	21 46.8 +59.6	61.3		22 15.5 +59.7	61.7		22 43.8 +59.8	62.0		23 11.7 +59.9	62.4		23 39.4 +59.9	62.8		24 06.6 +60.0	63.2		24 33.5 +60.0	63.6		25 00.0 +60.0	64.0		25
26	22 46.4 +59.6	61.2		23 15.2 +59.6	61.6		23 43.6 +59.7	61.9		24 11.6 +59.9	62.3		24 39.3 +59.9	62.7		25 06.5 +60.0	63.1		25 33.5 +60.0	63.6		26 00.0 +60.0	64.0		26
27	23 46.0 +59.5	61.0		24 14.8 +59.7	61.4		24 43.3 +59.8	61.8		25 11.5 +59.8	62.3		25 39.2 +59.9	62.7		26 06.5 +60.0	63.1		26 33.5 +60.0	63.5		27 00.0 +60.0	64.0		27
28	24 45.5 +59.6	60.9		25 14.5 +59.7	61.3		25 43.1 +59.8	61.7		26 11.3 +59.9	62.2		26 39.1 +59.9	62.6		27 06.5 +60.0	63.1		27 33.5 +60.0	63.5		28 00.0 +60.0	64.0		28
29	25 45.1 +59.5	60.8		26 14.2 +59.7	61.2		26 42.9 +59.8	61.6		27 11.2 +59.8	62.1		27 39.0 +60.0	62.6		28 06.5 +59.9	63.0		28 33.5 +60.0	63.5		29 00.0 +60.0	64.0		29
30	26 44.6 +59.6	60.6		27 13.9 +59.6	61.1		27 42.7 +59.7	61.5		28 11.0 +59.9	62.0		28 39.0 +59.9	62.5		29 06.4 +60.0	63.0		29 33.5 +59.9	63.5		30 00.0 +60.0	64.0		30
31	27 44.2 +59.5	60.5		28 13.5 +59.7	61.0		28 42.4 +59.8	61.4		29 10.9 +59.8	61.9		29 38.9 +59.9	62.4		30 06.4 +60.0	62.9		30 33.4 +60.0	63.5		31 00.0 +60.0	64.0		31
32	28 43.7 +59.5	60.4		29 13.2 +59.6	60.9		29 42.2 +59.7	61.3		30 10.7 +59.9	61.9		30 38.8 +59.9	62.4		31 06.3 +59.9	62.9		31 33.4 +60.0	63.4		32 00.0 +60.0	64.0		32
33	29 43.2 +59.6	60.2		30 12.8 +59.7	60.7		30 41.9 +59.8	61.2		31 10.6 +59.8	61.8		31 38.7 +59.9	62.3		32 06.3 +60.0	62.9		32 33.4 +60.0	63.4		33 00.0 +60.0	64.0		33
34	30 42.8 +59.5	60.1		31 12.5 +59.6	60.6		31 41.7 +59.7	61.1		32 10.4 +59.8	61.7		32 38.6 +59.9	62.3		33 06.3 +59.9	62.8		33 33.4 +60.0	63.4		34 00.0 +60.0	64.0		34
35	31 42.3 +59.5	59.9		32 12.1 +59.6	60.5		32 41.4 +59.8	61.0		33 10.2 +59.9	61.6		33 38.5 +59.9	62.2		34 06.2 +60.0	62.8		34 33.4 +60.0	63.4		35 00.0 +60.0	64.0		35
36	32 41.8 +59.4	59.8		33 11.7 +59.6	60.3		33 41.2 +59.7	60.9		34 10.1 +59.8	61.5		34 38.4 +59.9	62.1		35 06.2 +59.9	62.7		35 33.4 +60.0	63.4		36 00.0 +60.0	64.0		36
37	33 41.2 +59.5	59.6		34 11.3 +59.6	60.2		34 40.9 +59.7	60.8		35 09.9 +59.8	61.4		35 38.3 +59.9	62.0		36 06.1 +60.0	62.7		36 33.4 +60.0	63.3		37 00.0 +60.0	64.0		37
38	34 40.7 +59.																								

65°, 295° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.		
Dec.	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Dec.		
0	2 57.1 +59.7 114.8	2 31.9 +59.7 114.9	2 06.7 +59.8 114.9	1 41.4 +59.8 114.9	1 16.0 +60.0 115.0	0 50.7 +60.0 115.0	0 25.4 +59.9 115.0	0 00.0 +60.0 115.0	0	5 53.3 +59.6 114.3	7 30.6 +59.7 114.4	6 40.8 +59.8 114.6	6 15.7 +59.9 114.7	5 50.6 +59.9 114.8	5 25.3 +60.0 114.9	5 00.0 +60.0 115.0	5	13 56.8 +59.6 114.7	3 31.6 +59.8 114.8	3 06.5 +59.8 114.8	2 41.2 +59.9 114.9	2 16.0 +59.9 114.9	1 50.7 +59.9 115.0	1 25.3 +60.0 115.0	1 00.0 +60.0 115.0	0	
1	3 56.8 +59.6 114.7	3 31.6 +59.8 114.8	3 06.5 +59.8 114.8	2 41.4 +59.7 114.7	2 06.3 +59.8 114.8	1 41.1 +59.9 114.8	1 15.9 +59.9 114.9	2 50.6 +60.0 114.9	2	5 56.0 +59.7 114.5	5 31.1 +59.7 114.6	5 06.1 +59.8 114.7	4 41.0 +59.9 114.8	4 15.8 +60.0 114.8	3 50.6 +60.0 114.9	3 25.3 +60.0 114.9	3 00.0 +60.0 115.0	3	4 56.4 +59.6 114.6	4 31.4 +59.7 114.7	4 06.3 +59.8 114.8	3 41.1 +59.9 114.8	3 15.9 +59.9 114.9	2 50.6 +60.0 114.9	2 25.3 +60.0 115.0	2 00.0 +60.0 115.0	2
2	5 56.0 +59.7 114.5	5 31.1 +59.7 114.6	5 06.1 +59.8 114.7	6 05.9 +59.8 114.6	5 40.9 +59.9 114.7	5 15.8 +59.9 114.8	4 50.6 +60.0 114.9	4 25.3 +60.0 114.9	4	6 55.7 +59.6 114.4	6 30.8 +59.8 114.5	6 05.9 +59.8 114.6	7 05.6 +59.7 114.4	7 15.7 +59.9 114.5	5 50.6 +59.9 114.8	5 25.3 +60.0 114.9	5 00.0 +60.0 115.0	5	7 55.3 +59.6 114.3	7 30.6 +59.7 114.4	7 05.6 +59.8 114.5	8 05.5 +59.8 114.4	7 40.6 +59.9 114.6	6 50.5 +60.0 114.8	6 25.3 +60.0 114.9	6 00.0 +60.0 115.0	6
3	8 54.9 +59.6 114.2	8 30.3 +59.7 114.3	8 05.5 +59.8 114.4	9 54.5 +59.7 114.1	9 30.0 +59.7 114.2	9 05.3 +59.8 114.4	8 40.5 +59.9 114.5	8 15.6 +59.9 114.6	8	10 54.2 +59.6 113.9	10 29.7 +59.7 114.1	10 05.1 +59.8 114.3	9 40.4 +59.9 114.4	9 15.5 +59.9 114.6	8 50.5 +59.9 114.7	8 25.3 +60.0 114.9	8 00.0 +60.0 115.0	8	9 54.5 +59.7 114.1	9 30.0 +59.7 114.2	9 05.3 +59.8 114.4	10 49.4 +59.8 114.2	10 40.3 +59.8 114.4	9 50.4 +60.0 114.7	9 25.3 +60.0 114.9	9 00.0 +60.0 115.0	9
4	11 53.8 +59.6 113.8	11 29.4 +59.8 114.0	11 04.9 +59.8 114.2	12 53.4 +59.6 113.7	12 29.2 +59.7 113.9	12 04.7 +59.8 114.1	11 40.1 +59.9 114.3	11 15.4 +59.9 114.5	11	13 53.0 +59.6 113.6	13 28.9 +59.7 113.8	13 04.5 +59.8 114.0	12 40.0 +59.9 114.2	12 15.3 +59.9 114.4	11 50.4 +59.9 114.6	11 25.3 +60.0 114.8	11 00.0 +60.0 115.0	11	14 52.6 +59.6 113.5	14 28.6 +59.7 113.7	14 04.3 +59.8 113.9	13 39.9 +59.9 114.1	13 15.2 +59.9 114.4	12 50.3 +60.0 114.6	12 25.3 +60.0 114.8	12 00.0 +60.0 115.0	12
5	15 52.2 +59.6 113.4	15 28.3 +59.7 113.6	15 04.1 +59.8 113.9	16 51.8 +59.6 113.2	16 28.0 +59.7 113.5	16 03.9 +59.8 113.8	15 39.6 +59.9 114.0	15 15.1 +60.0 114.3	15	17 51.4 +59.6 113.1	17 27.7 +59.7 113.4	17 03.7 +59.8 113.7	16 39.5 +59.9 114.0	16 15.0 +59.9 114.2	15 50.2 +60.0 114.5	15 25.2 +60.0 114.8	15 00.0 +60.0 115.0	15	18 51.0 +59.6 113.0	18 27.4 +59.7 113.3	18 03.5 +59.8 113.6	17 39.4 +59.8 113.9	17 14.9 +60.0 114.2	16 50.2 +60.0 114.5	16 25.2 +60.0 114.7	16 00.0 +60.0 115.0	16
6	19 50.6 +59.6 112.9	19 27.1 +59.7 113.2	19 03.3 +59.8 113.5	20 50.2 +59.5 112.7	20 26.8 +59.7 113.1	20 03.1 +59.8 113.4	19 39.1 +59.9 113.8	19 14.8 +59.9 114.1	19	21 49.7 +59.6 112.6	21 26.5 +59.7 113.0	21 02.9 +59.8 113.3	20 39.0 +59.8 113.7	20 14.7 +59.9 114.0	19 50.1 +60.0 114.4	19 25.2 +60.0 114.7	19 00.0 +60.0 115.0	19	22 49.3 +59.6 112.5	22 26.2 +59.7 112.9	22 02.7 +59.8 113.2	21 38.8 +59.9 113.6	21 14.6 +59.9 114.0	20 50.1 +59.9 114.3	20 25.2 +60.0 114.7	20 00.0 +60.0 115.0	20
7	23 48.9 +59.5 112.4	23 25.9 +59.6 112.8	23 02.5 +59.7 113.2	24 48.4 +59.6 112.2	24 25.5 +59.7 112.6	24 02.2 +59.8 113.1	23 38.5 +59.9 113.5	23 14.5 +59.9 113.9	23	25 48.0 +59.5 112.1	25 25.2 +59.7 112.5	25 02.0 +59.8 113.0	24 38.4 +59.9 113.4	24 14.4 +59.9 113.8	23 50.0 +59.9 114.2	23 25.2 +60.0 114.6	23 00.0 +60.0 115.0	23	26 47.5 +59.6 111.9	26 24.9 +59.6 112.4	26 01.8 +59.8 112.9	25 38.3 +59.8 113.5	25 14.3 +59.9 113.7	24 49.9 +60.0 114.2	24 25.2 +60.0 114.6	24 00.0 +60.0 115.0	24
8	27 47.1 +59.5 111.8	27 24.5 +59.7 112.3	27 01.6 +59.7 112.8	28 46.6 +59.5 111.7	28 24.2 +59.6 112.2	28 01.3 +59.8 112.7	27 38.0 +59.8 113.2	27 14.1 +59.9 113.6	27	29 46.1 +59.5 111.5	29 23.8 +59.7 112.0	29 01.1 +59.7 112.6	28 37.8 +59.8 113.1	28 14.0 +60.0 113.6	27 49.8 +60.0 114.1	27 25.1 +60.0 114.5	27 00.0 +60.0 115.0	27	30 45.6 +59.5 111.4	30 23.5 +59.6 111.9	30 0.0 +59.8 112.5	29 37.6 +59.9 113.0	29 14.0 +59.9 113.5	28 49.8 +59.9 114.0	28 25.1 +60.0 114.5	28 00.0 +60.0 115.0	28
9	31 45.1 +59.5 111.2	31 23.1 +59.6 111.8	31 0.6 +59.7 112.4	32 44.6 +59.5 111.1	32 22.7 +59.7 111.7	32 0.3 +59.7 112.2	33 44.3 +59.5 110.7	33 22.0 +59.6 111.4	33	34 43.0 +59.4 110.6	34 21.6 +59.6 111.2	34 59.5 +59.7 111.9	34 36.8 +59.8 112.5	34 13.5 +59.9 113.2	33 49.6 +59.9 113.8	33 25.1 +60.0 114.4	33 00.0 +60.0 115.0	33	35 42.4 +59.4 110.4	35 21.2 +59.5 111.1	35 59.2 +59.7 111.8	36 36.6 +59.8 112.5	35 13.4 +59.9 113.1	34 49.5 +60.0 113.8	34 25.1 +60.0 114.4	34 00.0 +60.0 115.0	34
10	36 41.8 +59.4 110.2	37 20.7 +59.6 111.0	36 58.9 +59.7 111.7	37 41.2 +59.4 110.1	38 20.3 +59.6 110.8	37 58.6 +59.7 111.5	37 36.3 +59.8 112.3	37 30.3 +59.6 112.0	37	38 40.6 +59.4 109.9	39 19.9 +59.5 110.6	38 58.3 +59.7 111.4	38 36.1 +59.8 112.2	38 13.1 +59.9 112.9	37 49.4 +59.9 113.6	37 25.1 +60.0 114.6	37 00.0 +60.0 115.0	37	39 44.1 +59.4 110.9	33 22.4 +59.6 111.5	33 59.0 +59.8 112.1	32 37.2 +59.8 112.7	32 13.7 +59.9 113.2	31 49.7 +60.0 114.3	31 25.1 +60.0 114.4	31 00.0 +60.0 115.0	31
11	39 44.3 +59.5 110.7	34 22.0 +59.6 111.4	34 59.8 +59.7 112.0	35 43.0 +59.4 110.6	35 21.6 +59.6 111.2	35 54.9 +59.7 111.9	35 37.0 +59.8 112.6	35 33.7 +59.8 112.2	35	36 42.4 +59.4 110.4	36 21.4 +59.6 111.0	36 56.8 +59.7 111.7	36 36.4 +59.9 112.4	36 13.8 +59.9 113.0	35 49.7 +60.0 113.9	35 25.1 +60.0 114.5	35 00.0 +60.0 115.0	35	37 41.8 +59.4 110.2	37 20.7 +59.6 110.8	37 58.6 +59.7 111.5	37 36.3 +59.8 112.3	37 13.2 +59.9 113.0	36 49.4 +60.0 113.7	36 25.0 +60.0 114.3	36 00.0 +60.0 115.0	36
12	38 41.2 +59.4 110.1	38 20.3 +59.6 110.8	38 58.6 +59.7 111.5	39 40.6 +59.4 109.9	39 19.8 +59.5 110.6	39 58.2 +59.7 111.4	39 36.0 +59.8 112.0	39 33.7 +59.8 111.6	39	40 40.0 +59.4 109.7	40 19.4 +59.5 110.5	39 58.0 +59.7 111.3	39 35.9 +59.8 112.0	39 13.0 +59.9 112.8	38 49.3 +60.0 113.6	38 25.0 +60.0 114.3	38 00.0 +60.0 115.0	38	41 39.4 +59.3 109.5	41 18.9 +59.5 110.3	40 57.7 +59.7 111.1	40 35.7 +59.7 111.9	40 12.9 +59.8 112.7	39 49.3 +59.9 113.5	39 25.0 +60.0 114.3	39 00.0 +60.0 115.0	39
13	42 38.7 +59.3 109.3	42 18.4 +59.5 110.2	41 57.4 +59.6 111.0	43 37.9 +59.3 109.1	43 17.9 +59.5 110.0	42 57.0 +59.7 111.0	43 35.2 +59.8 110.7	43 17.4 +59.5 109.8	43	44 37.3 +59.2 108.9	44 17.4 +59.5 109.8	42 56.7 +59.6 110.7	43 35.0 +59.8 111.6	43 17.0 +59.7 109.7	42 49.5 +59.9 112.5	42 25.0 +60.0 114.2	42 00.0 +60.0 115.0	42	45 36.5 +59.3 108.6	45 16.9 +59.4 109.6	44 56.3 +59.6 110.5	44 34.8 +59.7 111.5	44 12.4 +59.8 112.4	43 49.1 +59.9 113.3	43 25.0 +59.9 114.1	43 00.0 +60.0 115.0	43
14	46 35.8 +59.2 108.4	46 15.1 +59.4 109.0	47 55.1 +59.6 110.0	48 34.2 +59.1 108.8	48 14.5 +59.4 109.9	47 54.7 +59.5 110.9	49 35.0 +59.6 109.7	49 13.5 +59.7 110.8	49	50 30.5 +59.0 108.6	50 11.9 +59.1 109.1	50 53.8 +59.5 109.5	50 33.2 +59.7 110.6	50 11.5 +59.8 110.8	49 49.5 +60.0 113.4	49 25.1 +60.0 114.4	49 00.0 +60.0 115.0	49	51 36.4 +59.1 108.4	51 12.8 +59.2 109.2	52 52.8 +59.4 109.1	52 32.6 +59.6 110.3	52 11.1 +59.8 111.5	51 48.5 +60.0 112.7	51 24.8 +60.0 113.9	51 00.0 +60.0 115.0	51
15	52 29.5 +58.8 108.3	53 11.8 +59.2 107.8	52 52.8 +59.4 109.1	54 28.4 +58.4 108.2	54 11.0 +59.2 107.5	53 52.2 +59.5 108.9	53 32.2 +59.7 109.1	53 10.9 +59.9 111.4	53	55 27.3 +58.8 105.9	55 10.2 +59.1 107.3	54 51.7 +59.4 108.6	54 31.9 +59.6 110.0	54 10.8 +59.8 111.3	53 48.4 +59.9 112.5	53 24.8 +60.0 113.8	53 00.0 +60.0 115.0	53	56 26.1 +58.8 105.5	56 9.3 +59.1 107.0	55 51.1 +59.4 108.4	55 31.5 +59.6 109.8	55 10.6 +59.7 111.1	54 48.3 +59.9 112.4	54 24.8 +59.9 113.7	54 00.0 +60.0 115.0	54
16	57 24.9 +58.7 105.2	57 8.4 +59.1 106.6	56 50.5 +59.4 108.1	58 07.5 +59.0 106.3	57 49.9 +59.3 107.8	57 30.7 +59.6 109.3	56 31.1 +59.6 109.6	56 10.3 +59.8 110.0	56	59 22.2 +58.5 104.3	59 7.3 +59.3 107.3	58 30.3 +59.5 109.1	58 09.3 +59.7 110.6	58 7.4 +59.7 110.6	57 48.0 +59.9 112.1	57 24.7 +60.0 113.7	57 00.0 +60.0 115.0	57	60 20.7 +58.4 103.9	60 5.4 +58.9 105.6	59 48.2 +59.7 106.3	59 29.8 +59.6 108.9	59 0.9 +59.7 110.6	58 47.			

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $65^\circ$ ,  $295^\circ$

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.				
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z					
0	2	57.1	-59.6	114.8	2	31.9	-59.7	114.9	2	06.7	-59.9	114.9	1	41.4	-59.9	114.9	1	16.0	-59.9	115.0	0	50.7	-60.0	115.0	0	0.00	+60.0	65.0	0
1	1	57.5	-59.6	114.9	1	32.2	-59.7	115.0	1	06.8	-59.8	115.0	0	41.5	-59.9	115.0	0	16.1	-59.9	115.0	0	09.3	+59.9	65.0	0	1.00	+60.0	65.0	1
2	0	57.9	-59.7	115.1	0	32.5	-59.8	115.1	0	07.0	-59.8	115.1	0	18.4	+59.9	64.9	0	43.8	+60.0	64.9	1	09.2	+60.0	64.9	1	2.00	+60.0	65.0	2
3	0	01.8	+59.6	64.8	0	27.3	+59.7	64.8	0	52.8	+59.8	64.8	1	18.3	+59.9	64.9	1	43.8	+59.9	64.9	2	09.2	+60.0	64.9	2	3.00	+60.0	65.0	3
4	1	01.4	+59.6	64.7	1	27.0	+59.7	64.7	1	52.6	+59.8	64.8	2	18.2	+59.8	64.8	2	43.7	+59.9	64.8	3	09.2	+59.9	64.9	3	3.46	+60.0	65.0	4
5	2	01.0	+59.7	64.6	2	26.7	+59.8	64.6	2	52.4	+59.8	64.7	3	18.0	+59.9	64.7	3	43.6	+60.0	64.8	4	09.1	+60.0	64.9	4	4.00	+60.0	65.0	5
6	3	00.7	+59.6	64.5	3	26.5	+59.7	64.6	3	52.2	+59.8	64.6	4	17.9	+59.9	64.7	4	43.6	+59.9	64.7	5	09.1	+60.0	64.9	5	6.00	+60.0	65.0	6
7	4	00.3	+59.6	64.4	4	26.2	+59.7	64.5	4	52.0	+59.8	64.5	5	17.8	+59.9	64.6	5	43.5	+59.9	64.7	6	09.1	+60.0	64.8	6	7.00	+60.0	65.0	7
8	4	59.9	+59.7	64.3	5	25.9	+59.7	64.4	5	51.8	+59.8	64.4	6	17.7	+59.9	64.5	6	43.4	+59.9	64.6	7	09.1	+59.9	64.8	7	8.00	+60.0	65.0	8
9	5	59.6	+59.6	64.2	6	25.6	+59.8	64.3	6	51.7	+59.8	64.4	7	17.6	+59.9	64.5	7	43.3	+60.0	64.6	8	09.0	+60.0	64.7	8	9.00	+60.0	65.0	9
10	6	59.2	+59.6	64.1	7	25.4	+59.7	64.2	7	51.5	+59.8	64.3	8	17.4	+59.9	64.4	8	43.3	+59.9	64.6	9	09.0	+60.0	64.7	9	34.6	+60.0	64.8	10
11	7	58.8	+59.6	63.9	8	25.1	+59.7	64.1	8	51.3	+59.8	64.2	9	17.3	+59.9	64.3	9	43.2	+59.9	64.5	10	09.0	+59.9	64.7	10	11.00	+60.0	65.0	11
12	8	58.4	+59.7	63.8	9	24.8	+59.7	64.0	9	51.1	+59.8	64.1	10	17.2	+59.9	64.3	10	43.1	+60.0	64.5	11	08.9	+60.0	64.6	11	12.00	+60.0	65.0	12
13	9	58.1	+59.6	63.7	10	24.5	+59.8	63.9	10	50.9	+59.8	64.0	11	17.1	+59.8	64.2	11	43.1	+59.9	64.4	12	08.9	+60.0	64.6	12	13.00	+60.0	65.0	13
14	10	57.7	+59.6	63.6	11	24.3	+59.7	63.8	11	50.7	+59.8	64.0	12	16.9	+59.9	64.2	12	43.0	+59.9	64.4	13	08.9	+59.9	64.8	13	14.00	+60.0	65.0	14
15	11	57.3	+59.6	63.5	12	24.0	+59.7	63.7	12	50.5	+59.8	63.9	13	16.8	+59.9	64.1	13	42.9	+60.0	64.3	14	08.8	+60.0	64.5	14	15.00	+60.0	65.0	15
16	12	56.9	+59.6	63.4	13	23.7	+59.7	63.6	13	50.3	+59.8	63.8	14	16.7	+59.9	64.0	14	42.9	+59.9	64.3	15	08.8	+60.0	64.5	15	16.00	+60.0	65.0	16
17	13	56.5	+59.6	63.3	14	23.4	+59.7	63.5	14	50.1	+59.8	63.7	15	16.6	+59.8	64.0	15	42.8	+59.9	64.2	16	08.8	+59.9	64.5	16	17.00	+60.0	65.0	17
18	14	56.1	+59.6	63.1	15	23.1	+59.7	63.4	15	49.9	+59.8	63.6	16	16.4	+59.9	63.9	16	42.7	+59.9	64.2	17	08.7	+60.0	64.4	17	18.00	+60.0	65.0	18
19	15	55.7	+59.6	63.0	16	22.8	+59.7	63.3	16	49.7	+59.8	63.5	17	16.3	+59.9	63.8	17	42.6	+60.0	64.1	18	08.7	+60.0	64.4	18	19.00	+60.0	65.0	19
20	16	55.3	+59.6	62.9	17	22.5	+59.7	63.2	17	49.5	+59.8	63.5	18	16.2	+59.8	63.7	18	42.6	+59.9	64.0	19	08.7	+59.9	64.4	19	34.5	+60.0	64.7	20
21	17	54.9	+59.6	62.8	18	22.2	+59.7	63.1	18	49.3	+59.8	63.4	19	16.0	+59.9	63.7	19	42.5	+59.9	64.0	20	08.6	+60.0	64.3	20	13.45	+60.0	64.7	21
22	18	54.5	+59.6	62.7	19	21.9	+59.7	63.0	19	49.1	+59.8	63.3	20	15.9	+59.9	63.6	20	42.4	+59.9	63.9	21	08.6	+60.0	64.3	21	14.35	+60.0	64.6	22
23	19	54.1	+59.6	62.5	20	21.6	+59.7	62.9	20	48.9	+59.7	63.2	21	15.8	+59.8	63.5	21	42.3	+60.0	63.9	22	08.6	+59.9	64.2	22	13.00	+60.0	64.6	23
24	20	53.7	+59.6	62.4	21	21.3	+59.7	62.7	21	48.6	+59.8	63.1	22	15.6	+59.9	63.5	22	42.3	+59.9	63.8	23	08.5	+60.0	64.2	23	13.45	+59.9	64.6	24
25	21	53.3	+59.5	62.3	22	21.0	+59.7	62.6	22	48.4	+59.8	63.0	23	15.5	+59.8	63.4	23	42.2	+59.9	63.8	24	08.5	+60.0	64.2	24	13.44	+60.0	64.6	25
26	22	52.8	+59.6	62.1	23	20.7	+59.7	62.5	23	48.2	+59.8	62.9	24	15.3	+59.9	63.3	24	42.1	+59.9	63.7	25	08.5	+59.9	64.1	25	13.44	+60.0	64.6	26
27	23	52.4	+59.6	62.0	24	20.4	+59.6	62.4	24	48.0	+59.7	62.8	25	15.2	+59.8	63.2	25	42.0	+59.9	63.7	26	08.4	+60.0	64.1	26	13.44	+60.0	64.5	27
28	24	52.0	+59.5	61.9	25	20.0	+59.7	62.3	25	47.7	+59.8	62.7	26	15.0	+59.9	63.2	26	41.9	+59.9	63.6	27	08.4	+60.0	64.5	27	13.44	+60.0	65.0	28
29	25	51.5	+59.5	61.7	26	19.7	+59.7	62.2	26	47.5	+59.8	62.6	27	14.9	+59.8	63.1	27	41.8	+60.0	63.5	28	08.3	+60.0	64.0	28	13.44	+60.0	64.5	29
30	26	51.0	+59.6	61.6	27	19.4	+59.6	62.1	27	47.3	+59.7	62.5	28	14.7	+59.9	63.0	28	41.8	+59.9	63.5	29	08.3	+60.0	64.0	29	13.44	+60.0	64.5	30
31	27	50.6	+59.5	61.5	28	19.0	+59.7	61.9	28	47.0	+59.8	62.4	29	14.6	+59.8	62.9	29	41.7	+59.9	63.4	30	08.3	+59.9	63.9	30	13.44	+60.0	65.0	31
32	28	50.1	+59.5	61.3	29	18.7	+59.6	61.8	29	46.8	+59.7	62.3	30	14.4	+59.9	62.8	30	41.6	+59.9	63.4	31	08.2	+60.0	63.9	31	13.44	+60.0	65.0	32
33	29	49.6	+59.5	61.2	30	18.3	+59.6	61.7	30	46.5	+59.8	62.2	31	14.3	+59.8	62.7	31	41.5	+59.9	63.3	32	08.2	+59.9	63.8	32	13.44	+60.0	65.0	33
34	30	49.1	+59.5	61.0	31	17.9	+59.7	61.6	31	46.3	+59.7	62.1	32	14.1	+59.8	62.7	32	41.4	+59.9	63.3	33	08.1	+60.0	64.4	33	13.44	+60.0	65.0	34
35	31	48.6	+59.5	60.9	32	17.6	+59.6	61.4	32	46.0	+59.7	62.0	33	13.9	+59.8	62.6	33	41.3	+59.9	63.2	34	08.1	+60.0	63.8	34	13.44	+60.0	65.0	35
36	32	48.1	+59.5	60.7	33	17.2	+59.6	61.3	33	45.7	+59.8	62.5	34	13.7	+59.9	62.5	34	41.2	+59.9	63.1	35	08.1	+59.9	63.7	35	13.44	+60.0	65.0	36
37	33	47.6	+59.4	60.6	34	16.8	+59.6	61.2	34	45.5	+59.7	61.8	35	13.6	+59.8	62.4	35	41.1	+59.9	63.0	36	08.0	+60.0	63.7	36	13.44	+60.0	65.0	37
38	34	47.0	+59.5	60.4	35	16.4	+59.																						

66°, 294° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
Dec.	Hc	d	Z	Dec.																					
0	2 50.5	+59.6	113.8	2 26.2	+59.7	113.9	2 01.9	+59.8	113.9	1 37.6	+59.8	113.9	1 13.2	+59.9	114.0	0 48.8	+60.0	114.0	0 24.4	+60.0	114.0	0 00.0	+60.0	114.0	0
1	3 50.1	+59.6	113.7	3 25.9	+59.8	113.8	3 01.7	+59.8	113.8	2 37.4	+59.9	113.9	2 13.1	+59.9	113.9	1 48.8	+59.9	114.0	1 24.4	+60.0	114.0	1 00.0	+60.0	114.0	1
2	4 49.7	+59.6	113.6	4 25.7	+59.7	113.7	4 01.5	+59.8	113.8	3 37.3	+59.9	113.8	3 13.0	+60.0	113.9	2 48.7	+60.0	113.9	2 24.4	+60.0	114.0	2 00.0	+60.0	114.0	2
3	5 49.3	+59.7	113.5	5 25.4	+59.7	113.6	5 01.3	+59.8	113.7	4 37.2	+59.9	113.8	4 13.0	+59.9	113.8	3 48.7	+60.0	113.9	3 24.4	+60.0	114.0	3 00.0	+60.0	114.0	3
4	6 49.0	+59.6	113.4	6 25.1	+59.7	113.5	6 01.1	+59.8	113.6	5 37.1	+59.8	113.7	5 12.9	+59.9	113.8	4 48.7	+59.9	113.9	4 24.4	+60.0	114.0	4 00.0	+60.0	114.0	4
5	7 48.6	+59.6	113.3	7 24.8	+59.7	113.4	7 00.9	+59.8	113.5	6 36.9	+59.9	113.6	6 12.8	+60.0	113.7	5 48.6	+60.0	113.8	5 24.4	+60.0	114.0	5 00.0	+60.0	114.0	5
6	8 48.2	+59.6	113.2	8 24.5	+59.8	113.3	8 00.7	+59.8	113.4	7 36.8	+59.9	113.6	7 12.8	+59.9	113.7	6 48.6	+60.0	113.8	6 24.4	+59.9	114.0	6 00.0	+60.0	114.0	6
7	9 47.8	+59.6	113.1	9 24.3	+59.7	113.2	9 00.5	+59.8	113.4	8 36.7	+59.9	113.5	8 12.7	+59.9	113.6	7 48.6	+60.0	113.8	7 24.3	+60.0	114.0	7 00.0	+60.0	114.0	7
8	10 47.4	+59.7	112.9	10 24.0	+59.7	113.1	10 00.3	+59.9	113.3	9 36.6	+59.8	113.4	9 12.6	+60.0	113.6	8 48.6	+59.9	113.7	8 24.3	+60.0	114.0	8 00.0	+60.0	114.0	8
9	11 47.1	+59.6	112.8	11 23.7	+59.7	113.0	11 00.2	+59.8	113.2	10 36.4	+59.9	113.4	10 12.6	+59.9	113.5	9 48.5	+60.0	113.7	9 24.3	+60.0	114.0	9 00.0	+60.0	114.0	9
10	12 46.7	+59.6	112.7	12 23.4	+59.7	112.9	12 00.0	+59.8	113.1	11 36.3	+59.9	113.3	11 12.5	+59.9	113.5	10 48.5	+60.0	113.7	10 24.3	+60.0	113.8	10 00.0	+60.0	114.0	10
11	13 46.3	+59.6	112.6	13 23.1	+59.7	112.8	12 59.8	+59.8	113.0	12 36.2	+59.9	113.2	12 12.4	+59.9	113.4	11 48.5	+59.9	113.6	11 24.3	+60.0	113.8	11 00.0	+60.0	114.0	11
12	14 45.9	+59.6	112.5	14 22.8	+59.7	112.7	13 59.6	+59.7	112.9	13 36.1	+59.8	113.2	13 12.3	+60.0	113.4	12 48.4	+60.0	113.6	12 24.3	+60.0	113.8	12 00.0	+60.0	114.0	12
13	15 45.5	+59.6	112.3	15 22.5	+59.7	112.6	14 59.3	+59.8	112.9	14 35.9	+59.9	113.1	14 12.3	+59.9	113.3	13 48.4	+60.0	113.6	13 24.3	+60.0	113.8	13 00.0	+60.0	114.0	13
14	16 45.1	+59.6	112.2	16 22.2	+59.7	112.5	15 59.1	+59.8	112.8	15 35.8	+59.9	113.0	15 12.2	+59.9	113.3	14 48.4	+59.9	113.5	14 24.3	+60.0	113.8	14 00.0	+60.0	114.0	14
15	17 44.7	+59.5	112.1	17 21.9	+59.7	112.4	16 58.9	+59.8	112.7	16 35.7	+59.8	113.0	16 12.1	+59.9	113.2	15 48.3	+60.0	113.5	15 24.3	+60.0	113.8	15 00.0	+60.0	114.0	15
16	18 44.2	+59.6	112.0	18 21.6	+59.7	112.3	17 58.7	+59.8	112.6	17 35.5	+59.9	112.9	17 12.0	+60.0	113.2	16 48.3	+60.0	113.5	16 24.3	+60.0	114.0	16 00.0	+60.0	114.0	16
17	19 43.8	+59.6	111.9	19 21.3	+59.7	112.2	18 58.5	+59.8	112.5	18 35.4	+59.9	112.8	18 12.0	+59.9	113.1	17 48.3	+59.9	113.4	17 24.3	+60.0	113.7	17 00.0	+60.0	114.0	17
18	20 43.4	+59.6	111.7	20 21.0	+59.7	112.1	19 58.3	+59.8	112.4	19 35.3	+59.8	112.7	19 11.9	+59.9	113.1	18 48.2	+60.0	113.4	18 24.3	+60.0	113.7	18 00.0	+60.0	114.0	18
19	21 43.0	+59.5	111.6	21 20.7	+59.7	112.0	20 58.1	+59.8	112.3	20 35.1	+59.9	112.7	20 11.8	+59.9	113.0	19 48.2	+60.0	113.4	19 24.3	+60.0	114.0	19 00.0	+60.0	114.0	19
20	22 42.5	+59.6	111.5	22 20.4	+59.7	111.9	21 57.9	+59.7	112.2	21 35.0	+59.8	112.6	21 11.7	+60.0	113.0	20 48.2	+59.9	113.3	20 24.2	+60.0	113.7	20 00.0	+60.0	114.0	20
21	23 42.1	+59.5	111.3	23 20.1	+59.6	111.7	22 57.6	+59.8	112.1	22 34.8	+59.9	112.5	22 11.7	+59.9	112.9	21 48.1	+60.0	113.3	21 24.2	+60.0	113.6	21 00.0	+60.0	114.0	21
22	24 41.6	+59.6	111.2	24 19.7	+59.7	111.6	23 57.4	+59.8	112.0	23 34.7	+59.8	112.5	23 11.6	+59.9	112.9	22 48.1	+60.0	113.2	22 24.2	+60.0	113.6	22 00.0	+60.0	114.0	22
23	25 41.2	+59.5	111.1	25 19.4	+59.7	111.5	24 57.2	+59.7	112.0	24 34.5	+59.9	112.4	24 11.5	+59.9	112.8	23 48.1	+60.0	113.2	23 24.2	+60.0	113.6	23 00.0	+60.0	114.0	23
24	26 40.7	+59.6	110.9	26 19.1	+59.6	111.4	25 56.9	+59.8	111.9	25 34.4	+59.8	112.3	25 11.4	+59.9	112.7	24 48.0	+60.0	113.2	24 24.2	+60.0	113.6	24 00.0	+60.0	114.0	24
25	27 40.3	+59.5	110.8	27 18.7	+59.7	111.3	26 56.7	+59.8	111.8	26 34.2	+59.9	112.2	26 11.3	+59.9	112.7	25 48.0	+59.9	113.1	25 24.2	+60.0	113.6	25 00.0	+60.0	114.0	25
26	28 39.8	+59.5	110.6	28 18.4	+59.6	111.2	27 56.5	+59.7	111.7	27 34.1	+59.8	112.1	27 11.2	+60.0	112.6	26 47.9	+60.0	113.1	26 24.2	+60.0	113.5	26 00.0	+60.0	114.0	26
27	29 39.3	+59.5	110.5	29 18.0	+59.6	111.0	28 56.2	+59.8	111.6	28 33.9	+59.9	112.1	28 11.2	+59.9	112.6	27 47.9	+60.0	113.0	27 24.2	+60.0	113.5	27 00.0	+60.0	114.0	27
28	30 38.8	+59.5	110.4	30 17.6	+59.7	110.9	29 56.0	+59.7	111.4	29 33.8	+59.8	112.0	29 11.1	+59.9	112.5	28 47.9	+59.9	113.0	28 24.2	+60.0	113.5	28 00.0	+60.0	114.0	28
29	31 38.3	+59.5	110.2	31 17.3	+59.6	110.8	30 55.7	+59.8	111.3	30 33.6	+59.8	111.9	30 11.0	+59.9	112.4	29 47.8	+60.0	113.0	29 24.2	+59.9	113.5	29 00.0	+60.0	114.0	29
30	32 37.8	+59.4	110.0	32 16.9	+59.6	110.6	31 55.5	+59.7	111.2	31 33.4	+59.9	111.8	31 10.9	+59.9	112.4	30 47.8	+59.9	112.9	30 24.1	+60.0	113.5	30 00.0	+60.0	114.0	30
31	33 37.2	+59.5	109.9	33 16.5	+59.6	110.5	32 55.2	+59.7	111.1	32 33.3	+59.8	111.7	32 10.8	+59.9	112.3	31 47.7	+60.0	113.2	31 24.1	+60.0	113.4	31 00.0	+60.0	114.0	31
32	34 36.7	+59.4	109.7	34 16.1	+59.6	110.4	33 54.9	+59.7	111.0	33 33.1	+59.8	111.6	33 10.7	+59.9	112.2	32 47.7	+60.0	113.2	32 24.1	+60.0	113.4	32 00.0	+60.0	114.0	32
33	35 36.1	+59.4	109.6	35 15.7	+59.6	110.2	34 54.6	+59.7	110.9	34 32.9	+59.8	111.5	34 10.6	+59.9	112.2	33 47.7	+59.9	112.8	33 24.1	+60.0	113.4	33 00.0	+60.0	114.0	33
34	36 35.5	+59.5	109.4	36 15.3	+59.6	110.1	35 54.3	+59.8	110.8	35 32.7	+59.9	111.4	35 10.5	+59.9	112.1	34 47.6	+60.0	113.2	34 24.1	+60.0	113.4	34 00.0	+60.0	114.0	34
35	37 35.0	+59.4	109.2	37 14.9	+59.5	109.9	36 54.1	+59.6	110.6	36 32.6	+59.8	111.3	36 10.4	+59.9	112.0	35 47.6	+59.9	112.7	35 24.1	+60.0	113.4	35 00.0	+60.0	114.0	35
36	38 34.4	+59.3	109.0	38 14.4	+59.6	109.8	37 53.7	+59.7	110.5	37 32.4	+59.8	111.2	37 10.3	+59.9	111.9	36 47.5	+60.0	112.6	36 24.1	+60.0	113.3	36			

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $66^\circ$ , 294°

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
	Hc	d	Z	Hc	d	Z																			
0	2 50.5 -59.7	113.8		2 26.2 -59.7	113.9		2 01.9 -59.8	113.9		1 37.6 -59.9	113.9		1 13.2 -59.9	114.0		0 48.8 -60.0	114.0		0 24.4 -60.0	114.0		0 00.0 +60.0	66.0		0
1	1 50.8 -59.6	114.0		1 26.5 -59.7	114.0		1 02.1 -59.8	114.0		0 37.7 -59.9	114.0		0 11.2 +59.9	66.0		0 35.6 +60.0	66.0		1 00.0 +60.0	66.0		1			
2	0 51.2 -59.6	114.1		0 26.8 -59.8	114.1		0 02.3 -59.8	114.1		0 22.2 +59.9	65.9		0 46.7 +59.9	65.9		1 11.1 +60.0	65.9		1 35.6 +60.0	66.0		2 00.0 +60.0	66.0		2
3	0 08.4 +59.6	65.8		0 33.0 +59.7	65.8		0 57.5 +59.8	65.8		1 22.1 +59.9	65.9		1 46.6 +59.9	65.9		2 21.1 +60.0	65.9		2 35.6 +60.0	66.0		3 00.0 +60.0	66.0		3
4	1 08.0 +59.7	65.7		1 32.7 +59.7	65.7		1 57.3 +59.9	65.8		2 22.0 +59.8	65.8		2 46.5 +60.0	65.8		3 11.1 +59.9	65.9		3 35.6 +60.0	65.9		4 00.0 +60.0	66.0		4
5	2 07.7 +59.6	65.6		2 32.4 +59.8	65.6		2 57.2 +59.8	65.7		3 21.8 +59.9	65.7		3 46.5 +59.9	65.8		4 11.0 +60.0	65.9		4 35.6 +60.0	65.9		5 00.0 +60.0	66.0		5
6	3 07.3 +59.6	65.5		3 32.2 +59.7	65.5		3 57.0 +59.8	65.6		4 21.7 +59.9	65.7		4 46.4 +59.9	65.7		5 11.0 +60.0	65.8		5 35.6 +59.9	65.9		6 00.0 +60.0	66.0		6
7	4 06.9 +59.6	65.4		4 31.9 +59.7	65.4		4 56.8 +59.8	65.5		5 21.6 +59.9	65.6		5 46.3 +60.0	65.7		6 11.0 +60.0	65.8		6 35.5 +60.0	65.9		7 00.0 +60.0	66.0		7
8	5 06.5 +59.7	65.3		5 31.6 +59.7	65.4		5 56.6 +59.8	65.4		6 21.5 +59.8	65.5		6 46.3 +59.9	65.6		7 11.0 +59.9	65.8		7 35.5 +60.0	65.9		8 00.0 +60.0	66.0		8
9	6 06.2 +59.6	65.2		6 31.3 +59.7	65.3		6 56.4 +59.8	65.4		7 21.3 +59.9	65.5		7 46.2 +59.9	65.6		8 10.9 +60.0	65.7		8 35.5 +60.0	65.9		9 00.0 +60.0	66.0		9
10	7 05.8 +59.6	65.0		7 31.0 +59.8	65.2		7 56.2 +59.8	65.3		8 21.2 +59.9	65.4		8 46.1 +60.0	65.5		9 10.9 +60.0	65.7		9 35.5 +60.0	65.8		10 00.0 +60.0	66.0		10
11	8 05.4 +59.6	64.9		8 30.8 +59.7	65.1		8 56.0 +59.8	65.2		9 21.1 +59.9	65.3		9 46.1 +59.9	65.5		10 10.9 +59.9	65.7		10 35.5 +60.0	65.8		11 00.0 +60.0	66.0		11
12	9 05.0 +59.6	64.8		9 30.5 +59.7	65.0		9 55.8 +59.8	65.1		10 21.0 +59.8	65.3		10 46.0 +59.9	65.4		11 10.8 +60.0	65.6		11 35.5 +60.0	65.8		12 00.0 +60.0	66.0		12
13	10 04.6 +59.6	64.7		10 30.2 +59.7	64.9		10 55.6 +59.8	65.0		11 20.8 +59.9	65.2		11 45.9 +59.9	65.4		12 10.8 +60.0	65.6		12 35.5 +60.0	65.8		13 00.0 +60.0	66.0		13
14	11 04.2 +59.7	64.6		11 29.9 +59.7	64.8		11 55.4 +59.8	65.0		12 20.7 +59.9	65.1		12 45.8 +60.0	65.3		13 10.8 +59.9	65.6		13 35.5 +60.0	65.8		14 00.0 +60.0	66.0		14
15	12 03.9 +59.6	64.5		12 29.6 +59.7	64.7		12 55.2 +59.8	64.9		13 20.6 +59.9	65.1		13 45.8 +59.9	65.3		14 10.7 +60.0	65.5		14 35.5 +60.0	65.8		15 00.0 +60.0	66.0		15
16	13 03.5 +59.6	64.4		13 29.3 +59.7	64.6		13 55.0 +59.8	64.8		14 20.5 +59.8	65.0		14 45.7 +59.9	65.2		15 10.7 +60.0	65.5		15 35.5 +60.0	65.7		16 00.0 +60.0	66.0		16
17	14 03.1 +59.6	64.2		14 29.0 +59.8	64.5		14 54.8 +59.8	64.7		15 20.3 +59.9	64.9		15 45.6 +59.9	65.2		16 10.7 +59.9	65.5		16 35.5 +60.0	65.7		17 00.0 +60.0	66.0		17
18	15 02.7 +59.6	64.1		15 28.8 +59.7	64.4		15 54.6 +59.8	64.6		16 20.2 +59.9	64.9		16 45.5 +60.0	65.1		17 10.6 +60.0	65.4		17 35.5 +59.9	65.7		18 00.0 +60.0	66.0		18
19	16 02.3 +59.6	64.0		16 28.5 +59.7	64.3		16 54.4 +59.8	64.5		17 20.1 +59.8	64.8		17 45.5 +59.9	65.1		18 10.6 +60.0	65.4		18 35.4 +60.0	65.7		19 00.0 +60.0	66.0		19
20	17 01.9 +59.6	63.9		17 28.2 +59.7	64.2		17 54.2 +59.8	64.4		18 19.9 +59.9	64.7		18 45.4 +59.9	65.0		19 10.6 +59.9	65.4		19 35.4 +60.0	65.7		20 00.0 +60.0	66.0		20
21	18 01.5 +59.5	63.8		18 27.9 +59.6	64.0		18 54.0 +59.8	64.4		19 19.8 +59.9	64.7		19 45.3 +59.9	65.0		20 10.5 +60.0	65.3		20 35.4 +60.0	65.7		21 00.0 +60.0	66.0		21
22	19 01.0 +59.6	63.6		19 27.5 +59.7	63.9		19 53.8 +59.7	64.3		20 19.7 +59.8	64.6		20 45.2 +60.0	64.9		21 10.5 +60.0	65.3		21 35.4 +60.0	65.6		22 00.0 +60.0	66.0		22
23	20 00.6 +59.6	63.5		20 27.2 +59.7	63.8		20 53.5 +59.8	64.2		21 19.5 +59.9	64.5		21 45.2 +59.9	64.9		22 10.5 +59.9	65.2		22 35.4 +60.0	65.6		23 00.0 +60.0	66.0		23
24	21 00.2 +59.6	63.4		21 26.9 +59.7	63.7		21 53.3 +59.8	64.1		22 19.4 +59.8	64.4		22 45.1 +59.9	64.8		23 10.4 +60.0	65.2		23 35.4 +60.0	65.6		24 00.0 +60.0	66.0		24
25	21 59.8 +59.5	63.2		22 26.6 +59.7	63.6		22 53.1 +59.8	64.0		23 19.2 +59.9	64.4		23 45.0 +59.9	64.8		24 10.4 +60.0	65.2		24 35.4 +60.0	65.6		25 00.0 +60.0	66.0		25
26	22 59.3 +59.6	63.1		23 26.3 +59.7	63.5		23 52.9 +59.7	63.9		24 19.1 +59.8	64.3		24 44.9 +59.9	64.7		25 10.4 +59.9	65.1		25 35.4 +60.0	65.6		26 00.0 +60.0	66.0		26
27	23 58.9 +59.5	63.0		24 26.0 +59.6	63.4		24 52.6 +59.8	63.8		25 18.9 +59.9	64.2		25 44.8 +59.9	64.6		26 10.3 +60.0	65.1		26 35.4 +60.0	65.5		27 00.0 +60.0	66.0		27
28	24 58.4 +59.6	62.8		25 25.6 +59.7	63.3		25 52.4 +59.8	63.7		26 18.8 +59.8	64.1		26 44.7 +60.0	64.6		27 10.3 +59.9	65.0		27 35.4 +60.0	65.5		28 00.0 +60.0	66.0		28
29	25 58.0 +59.5	62.7		26 25.3 +59.6	63.2		26 52.2 +59.7	63.6		27 18.6 +59.9	64.1		27 44.7 +59.9	64.5		28 10.2 +60.0	65.0		28 35.4 +60.0	65.5		29 00.0 +60.0	66.0		29
30	26 57.5 +59.5	62.6		27 24.9 +59.7	63.0		27 51.9 +59.8	63.5		28 18.5 +59.8	64.0		28 44.6 +59.9	64.5		29 10.2 +60.0	65.0		29 35.3 +60.0	65.5		30 00.0 +60.0	66.0		30
31	27 57.0 +59.6	62.4		28 24.6 +59.6	62.9		28 51.7 +59.7	63.4		29 18.3 +59.9	63.9		29 44.5 +59.9	64.4		30 10.2 +59.9	64.9		30 35.3 +60.0	65.5		31 00.0 +60.0	66.0		31
32	28 56.6 +59.5	62.3		29 24.2 +59.7	62.8		29 51.4 +59.8	63.3		30 18.2 +59.8	63.8		30 44.4 +59.9	64.3		31 10.1 +60.0	64.9		31 35.3 +60.0	65.4		32 00.0 +60.0	66.0		32
33	29 56.1 +59.5	62.1		30 23.9 +59.6	62.7		30 51.2 +59.7	63.2		31 18.0 +59.8	63.7		31 44.3 +59.9	64.3		32 10.1 +59.9	64.8		32 35.3 +60.0	65.4		33 00.0 +60.0	66.0		33
34	30 55.6 +59.4	62.0		31 23.5 +59.6	62.5		31 50.9 +59.7	63.1		32 17.8 +59.9	63.6		32 44.2 +59.9	64.2		33 10.0 +60.0	64.8		33 35.3 +60.0	65.4		34 00.0 +60.0	66.0		34
35	31 55.0 +59.5	61.8		32 23.1 +59.6	62.4		32 50.6 +59.8	63.0		33 17.7 +59.8	63.5		33 44.1 +59.9	64.1		34 10.0 +59.9	64.7		34 35.3 +60.0	65.4		35 00.0 +60.0	66.0		35
36	32 54.5 +59.5	61.7		33 22.7 +59.6	62.3		33 50.4 +59.7	62.8		34 17.5 +59.8	63.5		34 44.0 +59.9	64.1		35 09.9 +60.0	64.7		35 35.3 +60.0	65.3		36 00.0 +60.0	66.0		36
37	33 54.0 +59.4	61.5		34 22.3 +59.6	62.1		34 50.1 +59.7	62.7		35 17.3 +59.8	63.4		35 43.9 +59.9	64.0		36 09.9 +59.9	64.7		36 35.3 +60.0	65.3		37 00.0 +60.0	66.0		37
38	34 53.4 +59.5	61.4		35 21.7 +59.5	62.3		3																		

67°, 293° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.				
Dec.	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	Dec.				
0	2	43.8	+59.6	112.8	2	20.4	+59.8	112.9	1	57.1	+59.8	112.9	1	33.7	+59.9	112.9	1	10.3	+59.9	113.0	0	46.9	+59.9	113.0	0	00.0	+60.0	113.0	0
1	3	43.4	+59.6	112.7	3	20.2	+59.7	112.8	2	56.9	+59.8	112.8	2	33.6	+59.9	112.9	2	10.2	+60.0	112.9	1	46.8	+60.0	113.0	1	00.0	+60.0	113.0	1
2	4	43.0	+59.6	112.6	4	19.9	+59.7	112.7	3	56.7	+59.8	112.8	3	33.5	+59.8	112.8	3	10.2	+59.9	112.9	2	46.8	+60.0	112.9	2	00.0	+60.0	113.0	2
3	5	42.6	+59.6	112.5	5	19.6	+59.7	112.6	4	56.5	+59.8	112.7	4	33.3	+59.9	112.8	4	10.1	+59.9	112.8	3	46.8	+60.0	112.9	3	00.0	+60.0	113.0	3
4	6	42.2	+59.7	112.4	6	19.3	+59.7	112.5	5	56.3	+59.8	112.6	5	33.2	+59.9	112.7	5	10.0	+60.0	112.8	4	46.8	+59.9	112.9	4	00.0	+60.0	113.0	4
5	7	41.9	+59.6	112.3	7	19.0	+59.8	112.4	6	56.1	+59.9	112.5	6	33.1	+59.9	112.6	6	10.0	+59.9	112.7	5	46.7	+60.0	112.8	5	00.0	+60.0	113.0	5
6	8	41.5	+59.6	112.2	8	18.8	+59.7	112.3	7	55.9	+59.8	112.4	7	33.0	+59.9	112.7	6	46.7	+60.0	112.8	6	23.4	+60.0	112.9	6	00.0	+60.0	113.0	6
7	9	41.1	+59.6	112.1	9	18.5	+59.7	112.2	8	55.7	+59.8	112.4	8	32.8	+59.9	112.5	8	9.8	+59.9	112.6	7	46.7	+59.9	112.8	7	00.0	+60.0	113.0	7
8	10	40.7	+59.6	111.9	10	18.2	+59.7	112.1	9	55.5	+59.8	112.3	9	32.7	+59.9	112.4	9	9.7	+60.0	112.6	8	46.6	+60.0	112.7	8	00.0	+60.0	113.0	8
9	11	40.3	+59.6	111.8	11	17.9	+59.7	112.0	10	55.3	+59.8	112.2	10	32.6	+59.9	112.4	10	9.7	+59.9	112.5	9	46.6	+60.0	112.7	9	00.0	+60.0	113.0	9
10	12	39.9	+59.6	111.7	12	17.6	+59.7	111.9	11	55.1	+59.8	112.1	11	32.5	+59.8	112.3	11	9.6	+59.9	112.5	10	46.6	+59.9	112.7	10	00.0	+60.0	113.0	10
11	13	39.5	+59.6	111.6	13	17.3	+59.7	111.8	12	54.9	+59.8	112.0	12	32.3	+59.9	112.2	12	9.5	+60.0	112.4	11	46.5	+60.0	112.6	11	00.0	+60.0	113.0	11
12	14	39.1	+59.6	111.5	14	17.0	+59.7	111.7	13	54.7	+59.8	111.9	13	32.2	+59.9	112.2	13	9.5	+59.9	112.4	12	46.5	+60.0	112.6	12	00.0	+60.0	113.0	12
13	15	38.7	+59.6	111.3	15	16.7	+59.7	111.6	14	54.5	+59.8	111.9	14	32.1	+59.8	112.1	14	9.4	+59.9	112.3	13	46.5	+59.9	112.6	13	00.0	+60.0	113.0	13
14	16	38.3	+59.6	111.2	16	16.4	+59.7	111.5	15	54.3	+59.8	111.8	15	31.9	+59.9	112.0	15	9.3	+59.9	112.3	14	46.4	+60.0	112.5	14	00.0	+60.0	113.0	14
15	17	37.9	+59.5	111.1	17	16.1	+59.7	111.4	16	54.1	+59.8	111.7	16	31.8	+59.9	112.0	16	9.2	+60.0	112.2	15	46.4	+60.0	112.5	15	00.0	+60.0	113.0	15
16	18	37.4	+59.6	111.0	18	15.8	+59.7	111.3	17	53.9	+59.8	111.6	17	31.7	+59.8	111.9	17	9.2	+59.9	112.2	16	46.4	+59.9	112.5	16	00.0	+60.0	113.0	16
17	19	37.0	+59.6	110.8	19	15.5	+59.7	111.2	18	53.7	+59.7	111.5	18	31.5	+59.9	111.8	18	9.1	+59.9	112.1	17	46.3	+60.0	112.4	17	00.0	+60.0	113.0	17
18	20	36.6	+59.6	110.7	20	15.2	+59.7	111.1	19	53.4	+59.8	111.4	19	31.4	+59.8	111.7	19	9.0	+59.9	112.1	18	46.3	+60.0	112.4	18	00.0	+60.0	113.0	18
19	21	36.2	+59.5	110.6	21	14.9	+59.6	111.0	20	53.2	+59.8	111.3	20	31.2	+59.9	111.7	20	8.9	+59.9	112.0	19	46.3	+59.9	112.4	19	00.0	+60.0	113.0	19
20	22	35.7	+59.6	110.5	22	14.5	+59.7	110.8	21	53.0	+59.8	111.2	21	31.1	+59.9	111.6	21	8.8	+60.0	112.0	20	46.2	+60.0	112.3	20	00.0	+60.0	113.0	20
21	23	35.3	+59.5	110.3	23	14.2	+59.7	110.7	22	52.8	+59.7	111.1	22	31.0	+59.8	111.5	22	8.8	+59.9	111.9	21	46.2	+60.0	112.3	21	00.0	+60.0	113.0	21
22	24	34.8	+59.5	110.2	24	13.9	+59.6	110.6	23	52.5	+59.8	110.9	23	30.8	+59.9	111.4	23	8.7	+59.7	111.8	22	46.2	+59.9	112.2	22	00.0	+60.0	113.0	22
23	25	34.3	+59.6	110.1	25	13.5	+59.7	110.5	24	52.3	+59.8	110.9	24	30.7	+59.8	111.4	24	8.6	+59.9	111.8	23	46.1	+60.0	112.2	23	00.0	+60.0	113.0	23
24	26	33.9	+59.5	109.9	26	13.2	+59.7	110.4	25	52.1	+59.7	110.8	25	30.5	+59.9	111.3	25	8.5	+59.9	111.7	24	46.1	+59.9	112.2	24	00.0	+60.0	113.0	24
25	27	33.4	+59.5	109.8	27	12.9	+59.6	110.3	26	51.8	+59.8	110.7	26	30.4	+59.8	111.2	26	8.4	+59.9	111.7	25	46.0	+60.0	112.1	25	00.0	+60.0	113.0	25
26	28	32.9	+59.5	109.6	28	12.5	+59.6	110.1	27	51.6	+59.7	110.6	27	30.2	+59.8	111.1	27	8.3	+59.9	111.6	26	46.0	+60.0	112.1	26	00.0	+60.0	113.0	26
27	29	32.4	+59.5	109.5	29	12.1	+59.7	110.0	28	51.3	+59.8	110.5	28	30.0	+59.9	111.0	28	8.2	+60.0	111.6	27	46.0	+59.9	112.0	27	00.0	+60.0	113.0	27
28	30	31.9	+59.5	109.3	30	11.8	+59.6	109.9	29	51.1	+59.7	110.4	29	29.9	+59.8	111.0	29	8.2	+59.9	111.5	28	45.9	+60.0	112.5	28	00.0	+60.0	113.0	28
29	31	31.4	+59.5	109.2	31	11.4	+59.6	109.8	30	50.8	+59.8	110.3	30	29.7	+59.8	110.9	30	8.1	+59.9	111.4	29	45.9	+59.9	112.0	29	00.0	+60.0	113.0	29
30	32	30.9	+59.4	109.0	32	11.0	+59.6	109.6	31	50.6	+59.7	110.2	31	29.5	+59.9	110.8	31	8.0	+59.9	111.4	30	45.8	+60.0	111.9	30	00.0	+60.0	113.0	30
31	33	30.3	+59.5	108.9	33	10.6	+59.6	109.5	32	50.3	+59.7	110.1	32	29.4	+59.8	110.7	32	7.9	+59.9	111.3	31	45.8	+60.0	111.9	31	00.0	+60.0	113.0	31
32	34	29.8	+59.4	108.7	34	10.2	+59.6	109.4	33	50.0	+59.7	110.0	33	29.2	+59.8	110.6	33	7.8	+59.9	111.2	32	45.8	+59.9	112.0	32	00.0	+60.0	113.0	32
33	35	29.2	+59.4	108.5	35	9.8	+59.6	109.2	34	49.7	+59.7	109.9	34	29.0	+59.8	110.5	34	7.7	+60.0	111.2	33	45.7	+60.0	111.8	33	00.0	+60.0	113.0	33
34	36	28.6	+59.4	108.4	36	9.4	+59.7	109.1	35	49.4	+59.8	109.4	35	28.8	+59.8	110.4	35	7.6	+59.9	111.1	34	45.7	+60.0	112.1	34	00.0	+60.0	113.0	34
35	37	28.0	+59.4	108.2	37	8.9	+59.6	108.9	36	49.1	+59.7	109.6	36	28.6	+59.8	110.3	36	7.5	+59.9	111.0	35	45.6	+60.0	112.3	35	00.0	+60.0	113.0	35
36	38	27.4	+59.4	108.0	38	8.5	+59.5	108.8	37	48.8	+59.7	109.5	37	28.5	+59.8	110.2	37	7.4	+59.9	110.9	36	45.6	+60.0	112.3	36	00.0	+60.0	113.0	36
37	39	26.8	+59.3	107.8	39	8.0	+59.6	108.6	38	48.5	+59.7	109.4	38																

**LATITUDE CONTRARY NAME TO DECLINATION**      **L.H.A. 67°, 293°**

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.
	Hc	d	Z	Hc	d	Z																			
0	2 43.8 -59.7	112.8		2 20.4 -59.7	112.9		1 57.1 -59.8	112.9		1 33.7 -59.9	112.9		1 10.3 -59.9	113.0		0 46.9 -60.0	113.0		0 23.4 -59.9	113.0		0 0.0 +60.0	67.0		0
1	1 44.1 -59.6	113.0		1 20.7 -59.7	113.0		0 57.3 -59.8	113.0		0 33.8 -59.8	113.0		0 10.4 -60.0	113.0		0 13.1 +60.0	67.0		0 36.5 +60.0	67.0		1 0.0 +60.0	67.0		1
2	0 44.5 -59.6	113.1		0 21.0 -59.7	113.1		0 0.25 +59.8	66.9		0 26.0 +59.9	66.9		0 49.6 +59.9	66.9		1 13.1 +59.9	66.9		1 36.5 +60.0	67.0		2 0.0 +60.0	67.0		2
3	0 15.1 +59.6	66.8		0 38.7 +59.7	66.8		1 0.23 +59.8	66.8		1 25.9 +59.9	66.9		1 49.5 +59.9	66.9		2 13.0 +60.0	66.9		2 36.5 +60.0	67.0		3 0.0 +60.0	67.0		3
4	1 14.7 +59.6	66.7		1 38.4 +59.8	66.7		2 0.21 +59.8	66.8		2 25.8 +59.9	66.8		2 49.4 +59.9	66.8		3 13.0 +60.0	66.9		3 36.5 +60.0	66.9		4 0.0 +60.0	67.0		4
5	2 14.3 +59.7	66.6		2 38.2 +59.7	66.6		3 0.19 +59.8	66.7		3 25.7 +59.8	66.7		3 49.3 +60.0	66.8		4 13.0 +59.9	66.9		4 36.5 +60.0	66.9		5 0.0 +60.0	67.0		5
6	3 14.0 +59.6	66.5		3 37.9 +59.7	66.5		4 0.17 +59.9	66.6		4 25.5 +59.9	66.7		4 49.3 +59.9	66.7		5 12.9 +60.0	66.8		5 36.5 +60.0	66.9		6 0.0 +60.0	67.0		6
7	4 13.6 +59.6	66.4		4 37.6 +59.7	66.4		5 0.16 +59.8	66.5		5 25.4 +59.9	66.6		5 49.2 +59.9	66.7		6 12.9 +60.0	66.8		6 36.5 +60.0	66.9		7 0.0 +60.0	67.0		7
8	5 13.2 +59.6	66.3		5 37.3 +59.7	66.3		6 0.14 +59.8	66.4		6 25.3 +59.9	66.5		6 49.1 +60.0	66.6		7 12.9 +59.9	66.8		7 36.5 +60.0	66.9		8 0.0 +60.0	67.0		8
9	6 12.8 +59.6	66.1		6 37.0 +59.8	66.2		7 0.12 +59.8	66.4		7 25.2 +59.8	66.5		7 49.1 +59.9	66.6		8 12.8 +60.0	66.7		8 36.5 +60.0	66.9		9 0.0 +60.0	67.0		9
10	7 12.4 +59.7	66.0		7 36.8 +59.7	66.1		8 0.10 +59.8	66.3		8 25.0 +59.9	66.4		8 49.0 +59.9	66.5		9 12.8 +60.0	66.7		9 36.5 +60.0	66.8		10 0.0 +60.0	67.0		10
11	8 12.1 +59.6	65.9		8 36.5 +59.7	66.0		9 0.08 +59.8	66.2		9 24.9 +59.9	66.3		9 48.9 +60.0	66.5		10 12.8 +59.9	66.7		10 36.5 +60.0	66.8		11 0.0 +60.0	67.0		11
12	9 11.7 +59.6	65.8		9 36.2 +59.7	65.9		10 0.06 +59.8	66.1		10 24.8 +59.9	66.3		10 48.9 +59.9	66.4		11 12.7 +60.0	66.6		11 36.5 +60.0	66.8		12 0.0 +60.0	67.0		12
13	10 11.3 +59.6	65.7		10 35.9 +59.7	65.9		11 0.04 +59.8	66.0		11 24.7 +59.8	66.2		11 48.8 +59.9	66.4		12 12.7 +60.0	66.6		12 36.5 +59.9	66.8		13 0.0 +60.0	67.0		13
14	11 10.9 +59.6	65.6		11 35.6 +59.7	65.8		12 0.02 +59.8	65.9		12 24.5 +59.9	66.1		12 48.7 +59.9	66.3		13 12.7 +59.9	66.6		13 36.4 +60.0	66.8		14 0.0 +60.0	67.0		14
15	12 10.5 +59.6	65.4		12 35.3 +59.7	65.6		13 0.00 +59.8	65.9		13 24.4 +59.9	66.1		13 48.6 +60.0	66.3		14 12.6 +60.0	66.5		14 36.4 +60.0	66.8		15 0.0 +60.0	67.0		15
16	13 10.1 +59.6	65.3		13 35.0 +59.7	65.5		13 59.8 +59.8	65.8		14 24.3 +59.8	66.0		14 48.6 +59.9	66.2		15 12.6 +60.0	66.5		15 36.4 +60.0	66.7		16 0.0 +60.0	67.0		16
17	14 09.7 +59.6	65.2		14 34.7 +59.7	65.4		14 59.6 +59.7	65.7		15 24.1 +59.9	65.9		15 48.5 +59.9	66.2		16 12.6 +59.9	66.5		16 36.4 +60.0	66.7		17 0.0 +60.0	67.0		17
18	15 09.3 +59.6	65.1		15 34.4 +59.7	65.3		15 59.3 +59.8	65.6		16 24.0 +59.9	65.9		16 48.4 +59.9	66.1		17 12.5 +60.0	66.4		17 36.4 +60.0	66.7		18 0.0 +60.0	67.0		18
19	16 08.9 +59.6	65.0		16 34.1 +59.7	65.2		16 59.1 +59.8	65.5		17 23.9 +59.8	65.8		17 48.3 +60.0	66.1		18 12.5 +60.0	66.4		18 36.4 +60.0	66.7		19 0.0 +60.0	67.0		19
20	17 08.5 +59.5	64.9		17 33.8 +59.7	65.1		17 58.9 +59.8	65.4		18 23.7 +59.9	65.7		18 48.3 +59.9	66.0		19 12.5 +59.9	66.3		19 36.4 +60.0	66.7		20 0.0 +60.0	67.0		20
21	18 08.0 +59.6	64.7		18 33.5 +59.7	65.0		18 58.7 +59.8	65.3		19 23.6 +59.9	65.7		19 48.2 +59.9	66.0		20 12.4 +60.0	66.3		20 36.4 +60.0	66.7		21 0.0 +60.0	67.0		21
22	19 07.6 +59.6	64.6		19 33.2 +59.7	64.9		19 58.5 +59.8	65.2		20 23.5 +59.8	65.6		20 48.1 +59.9	65.9		21 12.4 +60.0	66.3		21 36.4 +60.0	66.6		22 0.0 +60.0	67.0		22
23	20 07.2 +59.6	64.5		20 32.9 +59.7	64.8		20 58.3 +59.7	65.2		21 23.3 +59.9	65.5		21 48.0 +59.9	65.9		22 12.4 +59.9	66.2		22 36.4 +60.0	66.6		23 0.0 +60.0	67.0		23
24	21 06.8 +59.5	64.3		21 32.6 +59.6	64.7		21 58.0 +59.8	65.1		22 23.2 +59.8	65.4		22 47.9 +60.0	65.8		23 12.3 +60.0	66.2		23 36.4 +60.0	66.6		24 0.0 +60.0	67.0		24
25	22 06.3 +59.6	64.2		22 32.2 +59.7	64.6		22 57.8 +59.8	65.0		23 23.0 +59.9	65.4		23 47.9 +59.9	65.8		24 12.3 +60.0	66.2		24 36.4 +59.9	66.6		25 0.0 +60.0	67.0		25
26	23 05.9 +59.5	64.1		23 31.9 +59.7	64.5		23 57.6 +59.8	64.9		24 22.9 +59.8	65.3		24 47.8 +59.9	65.7		25 12.3 +59.9	66.1		25 36.3 +60.0	66.6		26 0.0 +60.0	67.0		26
27	24 05.4 +59.6	64.0		24 31.6 +59.6	64.4		24 57.4 +59.7	64.8		25 22.7 +59.9	65.2		25 47.7 +59.9	65.6		26 12.2 +60.0	66.1		26 36.3 +60.0	66.5		27 0.0 +60.0	67.0		27
28	25 05.0 +59.5	63.8		25 31.2 +59.7	64.2		25 57.1 +59.8	64.7		26 22.6 +59.8	65.1		26 47.6 +59.9	65.5		27 12.2 +59.9	66.0		27 36.3 +60.0	66.5		28 0.0 +60.0	67.0		28
29	26 04.5 +59.5	63.7		26 30.9 +59.6	64.1		26 56.9 +59.7	64.6		27 22.4 +59.9	65.0		27 47.5 +59.9	65.5		28 12.1 +60.0	66.0		28 36.3 +60.0	66.5		29 0.0 +60.0	67.0		29
30	27 04.0 +59.5	63.5		27 30.5 +59.7	64.0		27 56.6 +59.8	64.5		28 22.3 +59.8	65.0		28 47.4 +59.9	65.5		29 12.1 +60.0	66.0		29 36.3 +60.0	66.5		30 0.0 +60.0	67.0		30
31	28 03.5 +59.6	63.4		28 30.2 +59.6	63.9		28 56.4 +59.7	64.4		29 22.1 +59.8	64.9		29 47.3 +59.9	65.4		30 12.1 +59.9	65.9		30 36.3 +60.0	66.5		31 0.0 +60.0	67.0		31
32	29 03.1 +59.5	63.3		29 29.8 +59.7	63.8		29 56.1 +59.8	64.3		30 21.9 +59.9	64.8		30 47.2 +59.9	65.3		31 12.0 +60.0	65.9		31 36.3 +60.0	66.4		32 0.0 +60.0	67.0		32
33	30 02.6 +59.4	63.1		30 29.5 +59.6	63.6		30 55.9 +59.7	64.2		31 21.8 +59.8	64.7		31 47.1 +59.9	65.3		32 12.0 +59.9	65.8		32 36.3 +60.0	66.4		33 0.0 +60.0	67.0		33
34	31 02.0 +59.5	63.0		31 29.1 +59.6	63.5		31 55.6 +59.7	64.0		32 21.6 +59.8	64.6		32 47.0 +59.9	65.2		33 11.9 +60.0	65.8		33 36.3 +59.9	66.4		34 0.0 +60.0	67.0		34
35	32 01.5 +59.5	62.8		32 28.7 +59.6	63.4		32 55.3 +59.7	63.9		33 21.4 +59.8	64.5		33 46.9 +59.9	65.1		34 11.9 +59.9	65.7		34 36.2 +60.0	66.4		35 0.0 +60.0	67.0		35
36	33 01.0 +59.4	62.6		33 28.3 +59.6	63.2		33 55.0 +59.8	63.8		34 21.2 +59.8	64.4		34 46.8 +59.9	65.1		35 11.8 +60.0	65.7		35 36.2 +60.0	66.3		36 0.0 +60.0	67.0		36
37	34 00.4 +59.5	62.5		34 27.9 +59.6	63.1		34 54.8 +59.7	63.7		35 21.0 +59.9	64.3		35 46.7 +59.9	65.0		36 11.8 +59.9	65.6		36 36.2 +60.0	66.3		37 0.0 +60.0	67.0		37
38	34 59.9 +59.4	62.3		35 27.5 +59.5	62.9		35 44.5 +59.7	63.6																	

68°, 292° L.H.A.

## LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180° ....Zn=7  
L.H.A. less than 180° .....Zn=360°-Z

	83°			84°			85°			86°			87°			88°			89°			90°			Dec.				
Dec.	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	H	c	Z	Dec.				
0	2	37.0	+59.6	111.9	2	14.6	+59.8	111.9	1	52.3	+59.8	111.9	1	29.8	+59.9	112.0	1	07.4	+59.9	112.0	0	44.9	+60.0	112.0	0	00.0	+60.0	112.0	0
1	3	36.6	+59.6	111.7	3	14.4	+59.7	111.8	2	52.1	+59.8	111.8	2	29.7	+59.9	111.9	2	07.3	+60.0	111.9	1	44.9	+60.0	112.0	1	22.5	+60.0	112.0	1
2	4	36.2	+59.6	111.6	4	14.1	+59.7	111.7	3	51.9	+59.8	111.8	3	29.6	+59.9	111.8	3	07.3	+59.9	111.9	2	44.9	+60.0	112.0	2	22.5	+60.0	112.0	2
3	5	35.8	+59.7	111.5	5	13.8	+59.7	111.6	4	51.7	+59.8	111.7	4	29.5	+59.8	111.8	4	07.2	+59.9	111.8	3	44.9	+59.9	111.9	3	22.5	+60.0	112.0	3
4	6	35.5	+59.6	111.4	6	13.5	+59.7	111.5	5	51.5	+59.8	111.6	5	29.3	+59.9	111.7	5	07.1	+59.9	111.8	4	44.8	+60.0	111.9	4	22.4	+60.0	112.0	4
5	7	35.1	+59.6	111.3	7	13.2	+59.7	111.4	6	51.3	+59.8	111.5	6	29.2	+59.9	111.6	6	07.0	+60.0	111.7	5	44.8	+60.0	111.8	5	22.4	+60.0	112.0	5
6	8	34.7	+59.6	111.2	8	12.9	+59.7	111.3	7	51.1	+59.8	111.4	7	29.1	+59.9	111.6	7	06.9	+59.9	111.8	6	44.8	+60.0	111.9	6	22.4	+60.0	112.0	6
7	9	34.3	+59.6	111.1	9	12.6	+59.8	111.2	8	50.9	+59.8	111.4	8	29.0	+59.8	111.5	8	06.9	+59.9	111.6	7	44.7	+60.0	111.8	7	22.4	+60.0	112.0	7
8	10	33.9	+59.6	110.9	10	12.4	+59.7	111.1	9	50.7	+59.8	111.3	9	28.8	+59.9	111.4	9	06.8	+60.0	111.6	8	44.7	+60.0	111.7	8	22.4	+60.0	112.0	8
9	11	33.5	+59.6	110.8	11	12.1	+59.7	111.0	10	50.5	+59.8	111.2	10	28.7	+59.9	111.4	10	06.8	+59.9	111.5	9	44.7	+59.9	111.7	9	22.4	+60.0	112.0	9
10	12	33.1	+59.6	110.7	12	11.8	+59.7	110.9	11	50.3	+59.8	111.1	11	28.6	+59.8	111.3	11	06.7	+59.9	111.5	10	44.6	+60.0	111.7	10	22.4	+60.0	111.8	10
11	13	32.7	+59.6	110.6	13	11.5	+59.7	110.8	12	50.1	+59.8	111.0	12	28.4	+59.9	111.2	12	06.6	+59.9	111.4	11	44.6	+60.0	111.6	11	22.4	+60.0	112.0	11
12	14	32.3	+59.6	110.5	14	11.2	+59.7	110.7	13	49.9	+59.7	110.9	13	28.3	+59.9	111.2	13	06.5	+60.0	111.4	12	44.6	+59.9	111.6	12	22.4	+60.0	112.0	12
13	15	31.9	+59.5	110.3	15	10.9	+59.7	110.6	14	49.6	+59.8	110.8	14	28.2	+59.8	111.1	14	06.5	+59.9	111.3	13	44.5	+60.0	111.6	13	22.4	+60.0	112.0	13
14	16	31.4	+59.6	110.2	16	10.6	+59.7	110.5	15	49.4	+59.8	110.8	15	28.0	+59.9	111.0	15	06.4	+59.9	111.3	14	44.5	+60.0	111.5	14	22.4	+60.0	112.0	14
15	17	31.0	+59.6	110.1	17	10.3	+59.6	110.4	16	49.2	+59.8	110.7	16	27.9	+59.9	111.0	16	06.3	+59.9	111.2	15	44.5	+59.9	111.5	15	22.4	+60.0	112.0	15
16	18	30.6	+59.6	110.0	18	09.9	+59.7	110.3	17	49.0	+59.8	110.6	17	27.8	+59.8	110.9	17	06.2	+60.0	111.2	16	44.4	+60.0	111.5	16	22.3	+60.0	112.0	16
17	19	30.2	+59.5	109.8	19	09.6	+59.7	110.2	18	48.8	+59.8	110.5	18	27.6	+59.9	110.8	18	06.2	+59.9	111.1	17	44.4	+60.0	111.4	17	22.3	+60.0	112.0	17
18	20	29.7	+59.6	109.7	20	09.3	+59.7	110.1	19	48.6	+59.7	110.4	19	27.5	+59.8	110.7	19	06.1	+59.9	111.1	18	44.4	+59.9	111.4	18	22.3	+60.0	112.0	18
19	21	29.3	+59.5	109.6	21	09.0	+59.7	110.0	20	48.3	+59.8	110.3	20	27.3	+59.9	110.7	20	06.0	+59.9	111.0	19	44.3	+60.0	111.3	19	22.3	+60.0	112.0	19
20	22	28.8	+59.6	109.5	22	08.7	+59.6	109.8	21	48.1	+59.8	110.2	21	27.2	+59.9	110.6	21	05.9	+59.9	111.0	20	44.3	+60.0	111.3	20	22.3	+60.0	112.0	20
21	23	28.4	+59.5	109.3	23	08.3	+59.7	109.7	22	47.9	+59.8	110.1	22	27.1	+59.8	110.5	22	05.8	+60.0	110.9	21	44.3	+59.9	111.3	21	22.3	+60.0	112.0	21
22	24	27.9	+59.6	109.2	24	08.0	+59.7	109.6	23	47.7	+59.7	110.0	23	26.9	+59.9	110.4	23	05.8	+59.9	110.8	22	44.2	+60.0	111.2	22	22.3	+60.0	112.0	22
23	25	27.5	+59.5	109.0	25	07.7	+59.6	109.5	24	47.4	+59.8	109.9	24	26.8	+59.8	110.4	24	05.7	+59.9	110.8	23	44.2	+59.9	111.2	23	22.3	+60.0	112.0	23
24	26	27.0	+59.5	108.9	26	07.3	+59.7	109.4	25	47.2	+59.7	109.8	25	26.6	+59.8	110.3	25	05.6	+59.9	110.7	24	44.1	+60.0	111.2	24	22.3	+60.0	112.0	24
25	27	26.5	+59.5	108.8	27	07.0	+59.6	109.3	26	46.9	+59.8	109.7	26	26.4	+59.9	110.2	26	05.5	+59.9	110.7	25	44.1	+60.0	111.1	25	22.3	+60.0	112.0	25
26	28	26.0	+59.5	108.6	28	06.6	+59.6	109.1	27	46.7	+59.7	109.6	27	26.3	+59.8	110.1	27	05.4	+59.9	110.6	26	44.1	+59.9	111.5	26	22.3	+60.0	112.0	26
27	29	25.5	+59.5	108.5	29	06.2	+59.7	109.0	28	46.4	+59.8	109.5	28	26.1	+59.9	110.0	28	05.3	+59.9	110.5	27	44.0	+60.0	111.0	27	22.2	+60.0	112.0	27
28	30	25.0	+59.5	108.3	30	05.9	+59.6	108.9	29	46.2	+59.7	109.4	29	26.0	+59.8	110.0	29	05.2	+59.9	110.5	28	44.0	+59.9	111.5	28	22.2	+60.0	112.0	28
29	31	24.5	+59.4	108.2	31	05.5	+59.6	108.7	30	45.9	+59.7	109.3	30	25.8	+59.8	109.9	30	05.1	+59.9	110.4	29	43.9	+60.0	111.0	29	22.2	+60.0	112.0	29
30	32	23.9	+59.5	108.0	32	05.1	+59.6	108.6	31	45.6	+59.8	109.2	31	25.6	+59.9	109.8	31	05.0	+59.9	110.3	30	43.9	+60.0	111.0	30	22.2	+60.0	112.0	30
31	33	23.4	+59.4	107.9	33	04.7	+59.6	108.5	32	45.4	+59.7	109.1	32	25.4	+59.9	109.7	32	04.9	+59.9	110.3	31	43.9	+59.9	111.0	31	22.2	+60.0	112.0	31
32	34	22.8	+59.5	107.7	34	04.3	+59.6	108.3	33	45.1	+59.7	109.0	33	25.3	+59.8	109.6	33	04.8	+59.8	110.2	32	43.8	+60.0	111.4	32	22.2	+60.0	112.0	32
33	35	22.3	+59.4	107.5	35	03.9	+59.5	108.2	34	44.8	+59.7	108.9	34	25.1	+59.8	109.5	34	04.7	+59.9	110.1	33	43.8	+59.9	110.8	33	22.2	+60.0	112.0	33
34	36	21.7	+59.4	107.3	36	03.4	+59.6	108.7	35	44.5	+59.7	109.4	35	24.9	+59.8	109.4	35	04.6	+59.9	110.1	34	43.7	+60.0	111.4	34	22.2	+60.0	112.0	34
35	37	21.1	+59.3	107.2	37	03.0	+59.5	107.9	36	44.2	+59.7	108.6	36	24.7	+59.8	109.3	36	04.5	+59.9	110.0	35	43.7	+59.9	111.3	35	22.2	+60.0	112.0	35
36	38	20.4	+59.4	107.0	38	02.5	+59.6	107.7	37	43.9	+59.7	108.5	37	24.5	+59.8	109.2	37	04.4	+59.9	109.9	36	43.6	+60.0	111.0	36	22.1	+60.0	112.0	36
37	39	19.8	+59.4	106.8	39	02.1	+59.5	107.6	38																				

# LATITUDE CONTRARY NAME TO DECLINATION

L.H.A.  $68^\circ$ ,  $292^\circ$

Dec.	83°			84°			85°			86°			87°			88°			89°			90°			Dec.				
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z					
0	2	37.0	-59.6	111.9	2	14.6	-59.7	111.9	1	52.3	-59.8	111.9	1	29.8	-59.8	112.0	1	07.4	-59.9	112.0	0	44.9	-59.9	112.0	0	00.0	+60.0	68.0	0
1	1	37.4	-59.6	112.0	1	14.9	-59.7	112.0	0	52.5	-59.8	112.0	0	30.0	-59.9	112.0	0	07.5	-60.0	112.0	0	15.0	+60.0	68.0	1	00.0	+60.0	68.0	1
2	0	37.8	-59.6	112.1	0	15.2	-59.7	112.1	0	07.3	+59.9	67.9	1	07.2	+59.8	67.8	0	29.9	+59.9	67.9	0	52.5	+59.9	67.9	1	15.0	+60.0	68.0	2
3	0	21.8	+59.7	67.8	0	44.5	+59.7	67.8	2	12.5	+59.8	67.7	2	07.0	+59.8	67.8	2	29.8	+59.9	67.9	1	52.4	+59.9	67.9	2	15.0	+59.9	67.9	3
4	1	21.5	+59.6	67.7	1	44.2	+59.7	67.7	2	07.0	+59.8	67.8	2	29.7	+59.8	67.8	2	29.7	+59.8	67.8	2	52.3	+59.9	67.8	3	14.9	+60.0	67.9	4
5	2	21.1	+59.6	67.6	2	43.9	+59.8	67.6	3	06.8	+59.8	67.7	3	29.5	+59.9	67.7	3	52.2	+60.0	67.8	4	14.9	+60.0	67.9	5	00.0	+60.0	68.0	5
6	3	20.7	+59.6	67.5	3	43.7	+59.7	67.5	4	06.6	+59.8	67.6	4	29.4	+59.9	67.7	4	52.2	+59.9	67.7	5	45.9	+59.9	67.8	6	00.0	+60.0	68.0	6
7	4	20.3	+59.6	67.4	4	43.4	+59.7	67.4	5	06.4	+59.8	67.5	5	29.3	+59.8	67.6	5	52.1	+59.9	67.7	6	14.8	+60.0	67.8	7	37.5	+60.0	67.9	7
8	5	19.9	+59.6	67.2	5	43.1	+59.7	67.3	6	06.2	+59.8	67.4	6	29.1	+59.9	67.5	6	52.0	+60.0	67.6	7	14.8	+60.0	67.9	8	00.0	+60.0	68.0	8
9	6	19.5	+59.6	67.1	6	42.8	+59.7	67.2	7	06.0	+59.8	67.3	7	29.0	+59.9	67.5	7	52.0	+59.9	67.7	8	14.8	+59.9	67.9	9	00.0	+60.0	68.0	9
10	7	19.1	+59.7	67.0	7	42.5	+59.7	67.1	8	05.8	+59.8	67.3	8	28.9	+59.9	67.4	8	51.9	+59.9	67.5	9	14.7	+60.0	67.7	9	37.4	+60.0	67.8	10
11	8	18.8	+59.6	66.9	8	42.2	+59.7	67.0	9	05.6	+59.8	67.2	9	28.8	+59.9	67.3	9	51.8	+59.9	67.5	10	14.7	+60.0	67.7	10	37.4	+60.0	67.8	11
12	9	18.4	+59.6	66.8	9	41.9	+59.7	66.9	10	05.4	+59.8	67.1	10	28.6	+59.9	67.3	10	51.7	+60.0	67.4	11	14.7	+59.9	67.6	11	37.4	+60.0	67.8	12
13	10	18.0	+59.6	66.7	10	41.6	+59.8	66.8	11	05.2	+59.8	67.0	11	28.5	+59.9	67.2	11	51.7	+59.9	67.4	12	14.6	+60.0	67.6	12	37.4	+60.0	67.8	13
14	11	17.6	+59.6	66.5	11	41.4	+59.7	66.7	12	05.0	+59.8	66.9	12	28.4	+59.8	67.1	12	51.6	+59.9	67.3	13	14.6	+60.0	67.8	13	37.4	+60.0	67.8	14
15	12	17.2	+59.6	66.4	12	41.1	+59.7	66.6	13	04.8	+59.7	66.8	13	28.2	+59.9	67.1	13	51.5	+59.9	67.3	14	14.6	+59.9	67.5	14	37.4	+60.0	67.8	15
16	13	16.8	+59.6	66.3	13	40.8	+59.7	66.5	14	04.5	+59.8	66.8	14	28.1	+59.9	67.0	14	51.4	+60.0	67.2	15	14.5	+60.0	67.5	15	37.4	+60.0	67.7	16
17	14	16.4	+59.5	66.2	14	40.5	+59.7	66.4	15	04.3	+59.8	66.7	15	28.0	+59.8	66.9	15	51.4	+59.9	67.2	16	14.5	+60.0	67.4	16	37.4	+60.0	67.7	17
18	15	15.9	+59.6	66.1	15	40.2	+59.6	66.3	16	04.1	+59.8	66.6	16	27.8	+59.9	66.9	16	51.3	+59.9	67.1	17	14.5	+59.9	67.4	17	37.4	+60.0	67.7	18
19	16	15.5	+59.6	66.0	16	39.8	+59.7	66.2	17	03.9	+59.8	66.5	17	27.7	+59.9	66.8	17	51.2	+59.9	67.1	18	14.4	+60.0	67.4	18	37.4	+60.0	67.8	19
20	17	15.1	+59.6	65.8	17	39.5	+59.7	66.1	18	03.7	+59.8	66.4	18	27.6	+59.8	66.7	18	51.1	+60.0	67.0	19	14.4	+60.0	67.3	19	37.4	+60.0	67.7	20
21	18	14.7	+59.6	65.7	18	39.2	+59.7	66.0	19	03.5	+59.8	66.3	19	27.4	+59.9	66.6	19	51.1	+59.9	67.0	20	14.4	+59.9	67.3	20	37.4	+59.9	67.6	21
22	19	14.3	+59.5	65.6	19	38.9	+59.7	65.9	20	03.3	+59.7	66.2	20	27.3	+59.8	66.6	20	51.0	+59.9	66.9	21	14.3	+60.0	67.3	21	37.3	+60.0	67.6	22
23	20	13.8	+59.6	65.4	20	38.6	+59.7	65.8	21	03.0	+59.8	66.1	21	27.1	+59.9	66.5	21	50.9	+59.9	66.9	22	14.3	+60.0	67.2	22	37.3	+60.0	67.6	23
24	21	13.4	+59.5	65.3	21	38.3	+59.6	65.7	22	02.8	+59.8	66.0	22	27.0	+59.8	66.4	22	50.8	+59.9	66.8	23	14.3	+59.9	67.2	23	37.3	+60.0	67.6	24
25	22	12.9	+59.6	65.2	22	37.9	+59.7	65.6	23	02.6	+59.7	65.9	23	26.8	+59.9	66.3	23	50.7	+59.9	66.7	24	14.2	+60.0	67.2	24	37.3	+60.0	67.6	25
26	23	12.5	+59.5	65.1	23	37.6	+59.7	65.4	24	02.3	+59.8	65.9	24	26.7	+59.8	66.3	24	50.6	+60.0	66.7	25	14.2	+59.9	67.1	25	37.3	+60.0	67.6	26
27	24	12.0	+59.6	64.9	24	37.3	+59.6	65.3	25	02.1	+59.8	65.8	25	26.5	+59.9	66.2	25	50.6	+59.9	66.6	26	14.1	+60.0	67.1	26	37.3	+60.0	67.5	27
28	25	11.6	+59.5	64.8	25	36.9	+59.7	65.2	26	01.9	+59.7	65.7	26	26.4	+59.8	66.1	26	50.5	+59.9	66.6	27	14.1	+60.0	67.0	27	37.3	+60.0	67.5	28
29	26	11.1	+59.5	64.6	26	36.6	+59.6	65.1	27	01.6	+59.8	65.6	27	26.2	+59.9	66.0	27	50.4	+59.9	66.5	28	14.1	+59.9	67.0	28	37.3	+60.0	67.5	29
30	27	10.6	+59.5	64.5	27	36.2	+59.6	65.0	28	01.4	+59.7	65.5	28	26.1	+59.8	65.9	28	50.3	+59.9	66.4	29	14.0	+60.0	66.9	29	37.3	+60.0	67.5	30
31	28	10.1	+59.5	64.4	28	35.8	+59.7	64.8	29	01.1	+59.8	65.3	29	25.9	+59.8	65.9	29	50.2	+59.9	66.4	30	14.0	+59.9	66.9	30	37.3	+59.9	67.4	31
32	29	09.6	+59.5	64.2	29	35.5	+59.6	64.7	30	00.9	+59.7	65.2	30	25.7	+59.9	65.8	30	50.1	+59.9	66.3	31	13.9	+60.0	66.9	31	37.2	+60.0	67.4	32
33	30	09.1	+59.5	64.1	30	35.1	+59.6	64.6	31	00.6	+59.7	65.1	31	25.6	+59.8	65.7	31	50.0	+59.9	66.2	32	13.9	+60.0	66.8	32	37.2	+60.0	67.4	33
34	31	08.6	+59.5	63.9	31	34.7	+59.6	64.5	32	00.3	+59.7	65.0	32	25.4	+59.8	65.6	32	49.9	+59.9	66.3	33	13.9	+59.9	66.8	33	37.2	+60.0	67.4	34
35	32	08.1	+59.4	63.8	32	34.3	+59.6	64.3	33	00.0	+59.8	64.9	33	25.2	+59.8	65.5	33	49.8	+59.9	66.1	34	13.8	+60.0	66.7	34	37.2	+60.0	67.4	35
36	33	07.5	+59.5	63.6	33	33.9	+59.6	64.2	33	59.8	+59.7	64.8	34	25.0	+59.8	65.4	34	49.7	+59.9	66.0	35	13.8	+59.9	66.7	35	37.2	+60.0	67.3	36
37	34	07.0	+59.4	63.4	34	33.5	+59.6	64.0	34	59.5	+59.7	64.7	35	24.8	+59.8	65.3	35	49.6	+59.9	66.0	36	13.7	+60.0	66.6	36	37.2	+60.0	67.3	37
38	35	06.4	+59.4	63.3	35	33.1	+59.5	63.9	35	59.																			